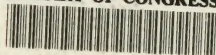


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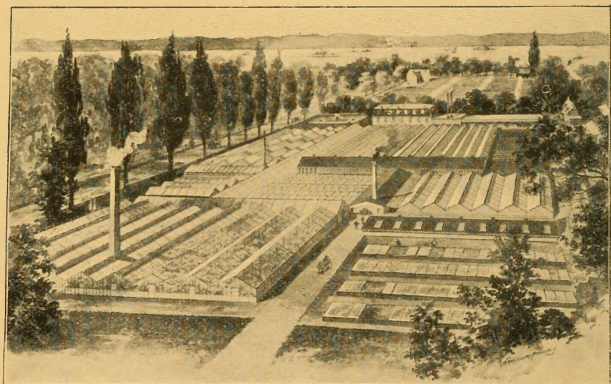
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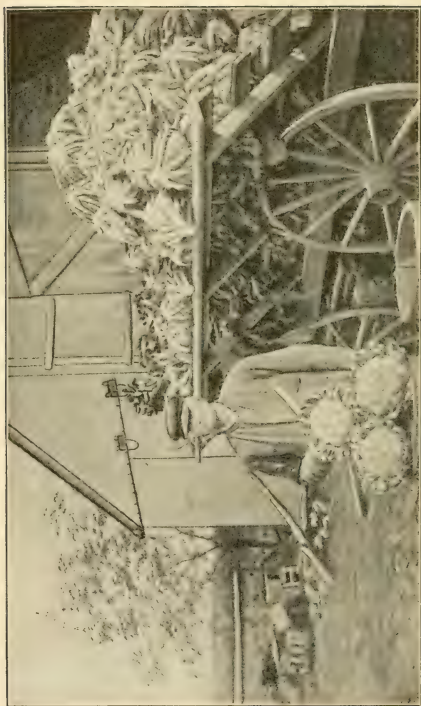
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SNOW-WHITE CAULIFLOWER BY THE TON.

Isaac N. Teed, Mattituck, Long Island. October 28, 1896. (See Index.)

DREER'S

OPEN-AIR VEGETABLES

A HANDBOOK BASED ON RECENT
FIELD OBSERVATIONS AND
TALKS WITH GARDENERS

PHILADELPHIA
HENRY A. DREER, Incorporated
714 Chestnut street

1897

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HENRY A. DREER.

SPANGLER & DAVIS, PRS., PHILA.

PREFACE.

The purpose of this little book is to explain cultural requirements: then to quote the views of practical gardeners.

The various vegetables, herbs, etc., will be grouped botanically, for the purpose of showing their natural affinities. This classification will render cultural hints and instructions more intelligible.

This book supplements a small work recently published (now in its second edition) called *VEGETABLES UNDER GLASS*, and should be used in connection therewith, as there is to-day no clear dividing line between vegetable culture in winter and in summer.

HENRY A. DREER,
Incorporated.

Philadelphia, March 1, 1897.

The best earthly peace and happiness will ever be closely associated with the cultivation of the soil, since in all plant-growing operations we are brought face to face with Nature's simple yet perfect processes.

PART I.

CHAPTER I.

BOTANICAL GROUPING.

The botanical place of a plant tells something of its natural requirements. Long periods of cultivation have worked great changes in the size, quality and succulence of vegetables, but in every case the ancestral type is still plainly visible. It is possible, therefore, to get some useful and practical hints from an arrangement or grouping of the common garden vegetables, based on their botanic affinities. The following has been prepared with that end in view.

THE MAIN GROUPS.

THE PULSES (manure makers): Peas, beans; plants having "butterfly" shaped blossoms.

MUSTARDS or CRUCIFERS (mostly hardy): Broccoli, Brussels sprouts, cabbage, cauliflower, collards, cress, horse-radish, kohl-rabi, kale or borecole, mustard, peppergrass, radish, ruta бага, sea kale, turnip, water cress.

THE NIGHTSHADES (mostly tender): Potato, egg plant, tomato, pepper.

THE GOURDS (mostly tender): Cantaloupe, cucumber, gherkin, gourd, melon, musk melon, pumpkin, squash, watermelon.

THE LILIES (mostly hardy): Asparagus, chives, garlic, leek, onion, shallot.

THE GOOSEFOOT GROUP (mostly hardy): Beet, chard, mangel wurzel, orach, spinach.

THE COMPOSITES (mostly hardy): Black salsify, cardoon, chicory, dandelion, endive, globe artichoke, Jerusalem artichoke, lettuce, salsify, sunflower, tansy, tarragon, wormwood.

THE PARSLEY TRIBE (mostly hardy) : Anise, caraway, carrot, celery, celeriac, chervil, coriander, cumin, dill, fennel, parsley, parsnip, sweet cicely.

THE MINTS (mostly hardy) : Balm, horehound, lavender, mint, rosemary, sage, savory, sweet basil, sweet marjoram, thyme.

OF VARIED KIN AND CHARACTER.

Sweet corn, of the Grass family.

Sweet potato, of the Convolvulus family.

Rhubarb and sorrel, of the Buckwheat family.

Okra or gombo, of the Mallow family.

Corn salad, of the Valerian family.

Strawberry, of the Rose family.

Borage, of the Borage family.

Caper, of the Caper family.

Rue, of the Rue family.

Bene and martynia, of the Bignonia family.

Nasturtium, of the Indian Cress family.

Mushroom, a fungus.

Chufa, a sedge.

In Part III. of this book the above groups are commented upon and explained in some detail, and certain significant facts concerning them pointed out.

J. H. Hale says it is essential to be a member of a good, working horticultural society.

CHAPTER II.

AT THE BEGINNING.

Without regard to the size of the garden (except in towns or villages where space is too limited), provision should be made for the use of the horse. The day of the spade is past, except in borders, seed beds or frames—though the Philadelphia cold frame gardeners use a horse even there. Horse labor is so economical, comparatively, that hand labor cannot compete with it.

The garden should be laid out the longest way, to avoid unnecessary turning, with rows two or two and a-half feet apart. A well-trained horse will work rows only twenty inches apart, but a two-foot width is better.

The land should be naturally rich and deep. The drainage must be made perfect. The exposure is less material now than formerly. Gardeners once worked for earliness, but now they find profits mainly in quality. A northern slope is well adapted to many special purposes, such as the wintering of hardy crops, like spinach, or the production of late strawberries. The winter sun has hostile qualities, as well as beneficial effects, and every exposure of ground has something to commend it. A deep and rich soil anywhere can be turned to advantage in gardening.

The slope should be gentle, to avoid washing of the soil when not under a crop ; though there is less reason to have bare ground now than before the advent of Crimson clover. This crop and the vetches promise to overturn many old American practices.

With the aid of a hundred tons of manure per acre great results can be obtained from deep soil that is well under-drained. American manuring seldom goes beyond fifty tons,

though the city market gardeners sometimes approach the 100-ton mark. English gardeners have gone as high as two hundred tons of rotted manure on deeply plowed and subsoiled land. Whether the English results justify the outlay will be an open question in America—until we do the same here.

The question of manuring will be mentioned in another chapter. It is good policy to feed plants somewhat as we feed animals—often and at regular intervals; for instance, to manure liberally for every crop.

The vegetable garden, as necessarily as the farm, must be worked on a systematic rotation, notwithstanding the frequent application of manure; otherwise a great waste of manure will occur, owing to the lack, perhaps, of a single element.

Crop diseases are liable to occur in land which is similarly treated year after year.

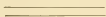
It is not common to look to the vegetable garden for landscape effects, but no expert gardener is unmindful of the fact that appearances have a good deal to do with the pleasure that follows successful work. It may, therefore, be suggested that the vegetable garden be laid out in a way that will permit the taller things, like corn, pole beans, etc., to always occupy what may be termed the background, while the perennials, like asparagus and rhubarb, come next, with the low annuals in the foreground. In some places there are no such things as "background" and "foreground," but in most situations these terms are applicable, and can be recognized in practice.

Corn and beans "rotate" quite well, as one is a pulse and the other a grass; and the whole group of low annuals can be pushed or shifted so as to bring them into fresh ground each year.

A horse with a modern steel-tooth cultivator will do a vast amount of work in a day, and do it well.

UNDER-GLASS WORK.

The open-air gardener must, of course, have a number of cold-frame and hot-bed sashes, and for hints on such work the reader is referred to our little book called *VEGETABLES UNDER GLASS*, published a few months before this one. It is unnecessary here to repeat the information therein contained, as these two volumes are intended to supplement each other.



Uncorrupt and happy days were those
When Roman consuls exercised their hoes ;
Whose leisure hours in country cares were spent,
And whose diversions all were innocent.
Oft their own arbours furnished out their feast,
And thus their fruits and sallads relished best.

ART OF GARDENING (author unknown).

CHAPTER III.

FERTILIZERS.

English experiments, conducted with great care through many decades, show that wheat can be permanently grown without the return of any kind of manure to the soil. The amount of the crop is not large enough to be profitable, but the experiments prove that the annual decomposition of the rocky constituents of the soil is no small contribution to our agricultural wealth. In other words, the formation of soil is not a very slow operation. Water, air, frost and sun join forces in tearing apart the sand grains and fitting them for plant food.

In practical agriculture and horticulture, however, nature's restorative processes are too slow, and the farmer and gardener must resort to manuring.

It is found in all cases that the soil is able to take care of itself in supplying plant food except with respect to three chemical requisites. These are nitrogen, phosphoric acid and potash.

Speaking in general terms, nitrogen is essential to the stem of the plant, potash to the fruit, and phosphoric acid to the seed.

Barnyard manure contains all of these desirable and essential aids to plant growth, and is said to be a "complete" fertilizer. An artificial manure which contains all three of these requisites is said to be a "complete" fertilizer.

Barnyard manure is rich in nitrogen, and, when used in excess, produces such a growth of stem that our grain crops are apt to lodge. The result is too much straw and too little grain.

Wheat farmers, therefore, demand a good deal of phos-

phoric acid in their fertilizer, and fruit-growers ask for potash. These facts accord with the above general statement.

Vegetable growers need "complete" manures to meet their various requirements, though special manures for special crops may be used to advantage at times. But, exceptions excepted, it is best for the market gardener to use "complete" fertilizers, and by a rotation of crops avoid losses that might otherwise occur.

Barnyard manure, properly fermented, is the best thing that a gardener can employ. This manure, spread green upon the soil, is not a desirable application in gardening, for several reasons. Green manure usually contains the seeds of grasses, and often the seeds of weeds, and it is not at once available as plant food. Its thorough fermentation kills the seeds that it contains, renders it fit for immediate use by plant roots, and insures a quick return for labor invested. No serious loss of chemical value occurs during the preparation of stable manure by turning and heating, though a heavy loss may occur if it is allowed to lie in neglected heaps about the premises, to become the prey of hostile fungi or to be leached by the rains. "Fire fang," aided by leaching and fermentation, may easily reduce by one-half the chemical value of a pile of manure in a single year.

CHEAPEST COMMERCIAL SOURCES. The cheapest known source of nitrogen, at the present time, is Crimson clover, or some other member of the pulse family. The clovers, peas, beans, vetches, tares, lupines, and all the plants of this great and useful botanical group, seem to have the power of taking nitrogen directly from the air, or from the air in the soil, by means of little lumps on their roots, which have been called "bacteroid tubercles." It is not necessary here to say much about the tubercles, except to remark that agricultural chemists now place a high money-producing value upon all plants having them. Such plants

are manure-makers of the highest practical value. To get nitrogen (the most expensive element of all fertilizers, both natural and artificial) we therefore need only go to Crimson clover, peas, or beans, and after plowing under the crop add phosphoric acid and potash in their common forms.

The cheapest commercial form of phosphoric acid at this time is ground bone or dissolved rock. Either is good if bought under the guarantee of a reliable dealer.

The cheapest form of potash is the muriate or the sulphate ; and any honest dealer in fertilizers may be trusted to furnish such an article. Wood ashes is a perfect source of potash, and when that can be had no other source need be sought.

As to some other available sources of valuable fertilizers, often carelessly lost, the reader is referred to Chapter VI.



"Vacant lot farming," in the vicinity of New York, devised to yield profitable employment to the poorer classes, has had the effect of emphasizing the great commercial possibilities of small pieces of land under high culture.

CHAPTER IV.

DRAINAGE.

Drainage aims to secure a quick disposition of surface water. On well-drained lands (even on clay soils) but little water will run off or over the surface during heavy falls of rain. Most of the rain will enter the ground.

Good drainage aerates the soil, without drying it. It facilitates the quick action of manures and fertilizers by putting the soil in proper mechanical condition for the rapid growth of plants. It makes the soil warmer, thus helping spring growth and deferring the effects of frost in autumn.

In a word, good drainage is essential to good horticulture.

As to construction of drains, their cost, etc., the problem is not necessarily a serious one. Much land is underlaid by gravel or rock, or porous subsoil of some sort, and needs no artificial draining of any kind.

On the other hand, drainage is emphatically needed wherever the land is wet or soggy for even a few hours after a rainfall; and in such situations the labor of laying drains will be speedily rewarded in the better results secured. Land of this character frequently tells of its need of drainage by producing a crop of rushes and sedges.

Told briefly, the problem of the drain maker is to find an underground channel, with good discharge, capable of receiving the surplus water of the soil; the deeper the drain below the surface the wider its lateral influence.

As a rule the main drain should occupy the lowest natural course; that is, the course which the surface water follows in passing off the land. Such a main line, say three or four feet under the natural surface, may solve the whole problem; if not, a lateral drain may be brought in by means of a Y tile at any desired point. This is on the assumption

that tile is employed for drain making. Stone and even wooden drains are sometimes used, but the round tile is believed to be the best device now on the market.

Tile could in 1896 be bought for \$15 per thousand for the 3-inch size, without collars, on cars at Albany, New York; and elsewhere at about the same rates. A thousand tiles will weigh about 4500 lbs., and as each tile is 13 inches long this number will be sufficient for about 1083 feet of ditch. Collars are wholly unnecessary in most cases, though sometimes of service in soft places, to prevent the ends of the tiles from getting out of place.

An elaborate system of drainage can be avoided, sometimes, by locating a hidden spring and leading its waters away from the land made wet by its flow; but in really deep, valuable land the best and most thorough system of drainage that can be devised will be found in every way desirable.

Under low culture the sum of \$10 per acre would be a serious charge to make against a large area for drainage, while under high culture on a small area the sum of \$200 per acre for drainage might not be unwarranted. Comparatively speaking, there are but few locations that would either need or justify the latter charge; but where an acre of land is to produce a thousand dollars per year in garden stuff the operator must expect a heavy outlay in making ready for high culture.

It is held by practical operators that the drainage belt increases rapidly in width as the drain is put further below the surface; that a drain four feet deep will take the water from a strip twice as wide as one laid but three feet below the surface; and that a depth of five feet will in practice really double the width of the four-foot drainage belt.

On land with a double (convergent) slope the plan above mentioned is advisable, while land with a single slope must be drained on the gridiron pattern. A simple, feasible system is to lay small round tiles (say two-inch size) in lines thirty feet apart and three feet under the surface of the ground. Good drainage pays in dollars.

CHAPTER V.

IRRIGATION.

Though there are ways of mitigating the effects of drouth, such as the creation of a "dust blanket" by the constant cultivation of the surface soil, the market gardener of to-day is subjected to a dangerous financial risk unless he is provided with means for artificial irrigation. The "dust



OPEN-FIELD IRRIGATION OF CUCUMBERS.

Crosby Brothers, Arlington, Massachusetts. July 4, 1896.

blanket" is good, as it effectually breaks up the capillary tubes by which the ground water finds its way to the air; but it does nothing more. It adds no water to the soil, and a crop loss is always possible. A drouth may come just at the critical period of growth, when a full supply of moisture is absolutely necessary to the quick development so essential to high quality in vegetables and fruits.

Speaking of this vital point, so good an authority as W. W. Rawson, of Boston, says that the old plan of trusting to rain for a water supply is no longer safe. "It becomes more and more evident every year," says Mr. Rawson, "that such a course will ruin the man who follows it; * * * all crops (some more than others), in addition to every other aid that can be given them, will need, besides, at certain times, abundant watering."

Observations made during the year 1896, by the firm of Henry A. Dreer, extending through several States, brought out many interesting and valuable points on this matter of irrigation.

At the many-acred market gardens of Mr. Rawson, at Arlington, near Boston, great iron pipes were seen on the surface of the ground. These iron pipes contain water under pressure, and by the attachment of rubber hose, 100 feet long, the water is distributed wherever wanted. The Rawson idea is an inch of water per week on rapidly growing crops; not more. The iron pipes can be moved from place to place in spring or fall, if desired, but are stationary during the summer season. "Seven or eight hosemen at work, throwing water on beds of parsley, celery, etc." (Notes of July 14, 1896). The Rawson water supply is from a private pumping station.

The dragging from place to place of heavy rubber hose is a serious matter, and another Massachusetts plan must be mentioned, where the entire operation is automatic. The Hittinger Brothers, at Belmont, have elevated iron pipes,

containing water under twenty-five pounds' pressure, the distribution being effected by revolving sprinklers on lateral or branch pipes. This arrangement puts the pipes out of the way of the plow and cultivator, saves the time and labor of several men, effects a perfect distribution of water on the plan of falling rain, and is the most satisfactory and economical system within our present knowledge. It is quite fully described in *VEGETABLES UNDER GLASS*.

Under a system of irrigation it is entirely safe to use artificial fertilizers to an extent that would otherwise be dangerous, if not wasteful. With water a full ton of high-grade phosphate may be employed, in addition to stable manure. The fertilizer will return in crop forms.

John Repp, Glassboro, N. J., pumps water from a pond, uses a two-inch main, and runs parallel branch iron pipes on the gridiron plan to water a three-acre tract. The two-inch permanent main is underground; the one-inch laterals (seventy feet apart) are laid on the surface. The laterals have T-joints, with cocks, at thirty-six-foot intervals, for the attachment of rubber hose pipes.

John G. Gardner, West Conshohocken, in summer moves a boiler from the barn to a position near a running stream, attaches a steam pump, and by means of rubber hose pipes irrigates a large garden. In 1895 one hundred thousand celery plants were thus watered.

William Embree, of West Chester, Pennsylvania, takes the water of a hillside spring and leads it to the rows of his truck patch, turning it into the rows where the land is highest, and permitting it to find its way by gravity to all parts of the garden.

James Jordan, of Auburn, Rhode Island, near Providence, irrigates his garden with a long rubber hose, obtaining water from a public street main.

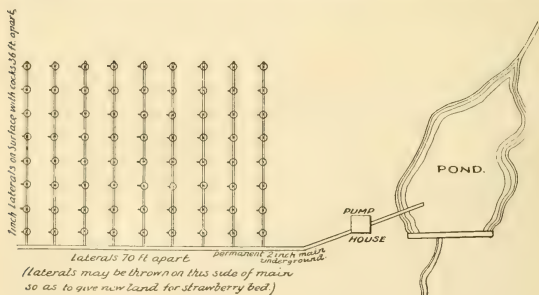
Irrigation in some parts of New England is the rule, while in New Jersey and Pennsylvania it is still the excep-

tion. It must come, however, wherever the highest results are expected. Mr. Rawson's comment is warranted. It cannot be dispensed with, for such a course will "ruin the man who follows it." The market gardener pays out much money for rent, for drainage, for fertilizer, for deep culture, for good seeds, for labor, and must not incur the risk of crop failure from drouth. Good drainage and irrigation remove most of the uncertainties of the weather.

JOHN REPP'S PLAN.

Of the several methods above outlined that of John Repp has certain features of wide application. The diagram will show the operation of the system.

Mr. Repp uses the ground thus irrigated for strawberries. The strawberry rows are set twenty-eight and twenty



JOHN REPP'S IRRIGATION SYSTEM.

inches apart, alternately, all across the patch. This permits of horse cultivation. At the last working, say in July, the twenty-inch rows are worked out deep in the centre. The twenty-eight-inch rows are afterwards worked shallow, and all runners are thrown over into the twenty-inch rows, where they take root.

The final result is that beds twenty inches wide are formed, with hollow or depressed centres, along which water from the rubber pipes finds its way during the spring irrigation. The twenty-eight-inch open spaces are the paths used by the berry pickers.

The operation of the pump at the pond is practically incessant during the fruit-setting season, for the rubber pipes are constantly shifted, and when the patch has been thoroughly soaked (three days' work) it is time to start again at the beginning.

Mr. Repp's 1896 patch contained three acres. He has sold \$1500 worth of strawberries from a two-acre patch, and the business is still profitable. His system of irrigation permits a shifting of the surface pipes to the other side of the main, so that the strawberry bed can be put upon new ground at intervals of a few years.

CHAPTER VI.

TWENTY-FIVE DOLLARS IN GOLD.

In this chapter plain talk is necessary, for there is a great and unpardonable money waste at the average rural home in America.

The practical gardener is always confronted with the need of fertilizers, and the housekeeper is always confronted with the problem of quickly and safely disposing of many waste products ; yet a full co-operation between gardener and housekeeper is not yet in successful general practice in America.

The waste of every house includes fecal matter, chamber slops, kitchen and wash water, bones, ashes, bits of food, the trimmings of meats and vegetables, and many minor things.

There seems to be no better way to show the volume and the value of this waste than to assert that it is annually worth on the average not less than twenty-five dollars in gold, expressed in terms of ordinary commercial fertilizer value. This estimate is based on the assumption that the average family contains four persons, and that the daily waste from each individual is worth at least two cents, from the standpoint of the agricultural chemist. The single item of nitrogen in the urine is placed by chemists at more than half a cent.

This "twenty-five dollars in gold" is not only thrown away and lost, but, worse than that, the material which it represents commonly goes where it will do the most harm. It too frequently pollutes the water supply, winning for rural communities higher typhoid statistics than the figures shown by crowded cities. This system is wrong, both economically and morally.

The great item of "doctors' bills" cannot be expressed in dollars so well as can the value of the lost fertilizer; but when discomfort, ill health, even death, are taken into account, it will be seen that another twenty-five dollars is represented in the term "poisoned water."

The deep cesspool is neither necessary nor wise. Fecal matter (night soil) is properly disposed of by converting it into loam: not by merely burying it, but by actually changing it into soil.

The upper stratum of every garden or field is different from the subsoil. It is usually darker in color, and is better fitted to support plant life than the underlying clay. When the clay is turned up by deep plowing it speedily becomes top-soil, and under good culture it finally assumes the color and character of the upper layer. New soil has, in fact, been made of it.

We are just beginning to understand the real character of "good soil." Agricultural observers now recognize the presence in the upper soil of countless numbers of bacteria; microscopic forms of life. These bacteria depend for their existence on the conditions which exist just under the surface of the ground—air, moisture and organic matter. They cannot live at great depths in the earth, and are most numerous where the soil is richest.

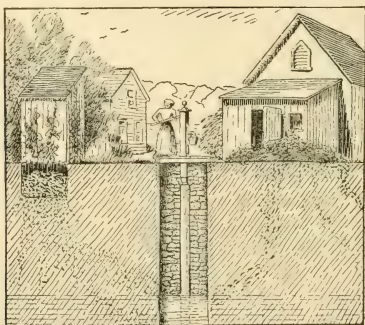
Nature assigns to the bacteria the quick disposal and transformation of all dead or waste matter which enters the soil. This is her laboratory, and these are her workers in a noble service.

The upper soil, therefore, is the proper destiny of all waste organic substance. The sunshine, the air, the rain, the myriads of little workers in the soil—these all combine to produce a quick destruction of old forms and fit them for a new cycle of organic existence.

A hint may be had from the stable. Cow manure if dried remains unchanged. If thrown into a heap it lies for a

long time in a cold, wet condition. If put into the soil, on the contrary, it quickly ceases to be manure. In three weeks time (more or less) it has changed its mechanical condition, has become dark in color, and falls to pieces like soil when turned up with spade or plow. It has become soil in fact.

Nothing could be more remarkable than the speed and the thoroughness with which the little soil workers (aided by heat, warmth and moisture) do their work; and when nature's economy is fully understood no more deep pits or



LOST WEALTH AND LOST HEALTH.

[From a sketch made by Dr. Theobald Smith, of Jamaica Plain, Massachusetts, published by the U. S. Department of Agriculture in Farmers' Bulletin No. 43, "Sewage Disposal on the Farm," written by Dr. Smith.]

cesspools will be constructed, for the friendly bacteria cannot work far under ground, and fecal waste poured into deep vaults or cesspools falls a prey to highly offensive ferments, and becomes a menace to subterranean streams of water.

Experiments prove that rich soil can be used over and over again for the conversion of excreta into loam, though at rural homes there is no need to use soil for the purpose more than once.

Still, the fact is interesting as showing the profound

change which occurs in thus quickly converting offensive matter into harmless, fertile, non-odorous loam.

Instead of using the product a second time for the same purpose the market gardener should employ fresh soil, and thus secure the greatest possible bulk of highly enriched loam.

No pit or cesspool in the rural districts should be more than two feet deep, and the sides and bottom should be laid with stone or brick, and well cemented, so as to permit no liquid to enter the soil.

The method of saving excreta and all other waste matter is purely a local question in every case. No high-priced appliances or devices are essential. No especial tools, implements or methods are demanded. Cleanliness and decency are desired by every household, and are within everybody's reach, and all considerations demand the proper disposition of the household waste. Good morality sanctions no wanton sacrifice of either wealth or health.

As to other household products that should go to the soil, little need be said. Sifted ashes makes a good absorbent. Chamber slops belong on the compost heap, along with all refuse from the kitchen, the heap to be frequently coated with fresh earth. Wash water, including the flow from the kitchen sink, should reach land that can be cultivated, for it carries with it every day appreciable amounts of valuable fertilizers.

The cost of labor in America is responsible for much of the carelessness about home-produced fertilizers. It has been thought cheaper to buy than to save. The time for a change has now arrived, and if stern necessity demands wiser methods the results may be beneficial in more than one way.

The barn waste is a serious loss in many places—greater in dollars, perhaps, than the loss at the house. It may be less hostile to human health, but it is wholly inexcusable, as it is a constant threat to the health of the farm animals themselves.

The Japanese carry the house waste (night soil) to the fields in jars, and thus dispose of it wisely and economically. Several European cities use the earth closet system, which has much to commend it as compared with the water carriage plan of American cities and towns. In rural America the most economic, effectual and satisfactory disposition of night soil will be found in the use of loam, as already indicated, either on the earth closet principle or by a method which will preserve the product (in prepared condition) under a shed until needed for crop-stimulating purposes.

A LITTLE TECHNICAL TALK. It is now known that there are many kinds of minute destructive agents which prey upon organic matter.

Take the case of milk, for instance. There are ferments (caused by bacteria) which are friendly to the dairyman, and others which are distinctly hostile, the latter producing rank, low-grade butter.

The same is true concerning manures. There are destructive ferments whose products are wholly foul and offensive, and there are other processes whose working is entirely unobjectionable.

Putrefaction is the word descriptive of the foul-smelling, abominable process which goes on in the dark depths of the cesspool.

Humification (or nitrification) is the word descriptive of the process which goes on in the upper soil.

The money-seeking, health-seeking market gardener will therefore try to "humify" rather than "putrefy" the household waste.

The stacking and turning of stable manure, preparatory to putting on the land, is a humifying process, as it greatly aids nitrification while distinctly discouraging putrefaction. Such manure makes quick plant food.

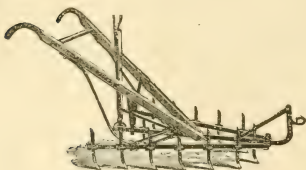
Humification preserves value, while putrefaction wastes the volatile elements and robs the manure of half its worth.

THE VALUE OF ASHES. Wood ashes is particularly valuable for fruit trees, on account of the potash which it contains. Coal ashes has some little value as a fertilizer, because of the organic refuse burned in every kitchen fire. Its chief value, however, is for putting on heavy soils, which it helps to open ; for draining beds of bulbs in autumn, where it also affords protection ; for working into cucumber and melon hills, where its effect is beneficial. It is worth decidedly more than the cost of spreading. When dry it is a good absorbent of liquids, and may be used for that purpose.

Cottage gardens, in a moral and political point of view, are of obvious importance, attaching the cottager to his home and to his country, by inducing sober, industrious and domestic habits, and by creating that feeling of independence which is the best security against pauperism.

CHAPTER VII.

IMPLEMENTS, SEEDS, ETC.



Few tools are absolutely essential to success if the gardener be enthusiastic. It is far more important to know what should be done than to have the tools with which to do the work. It is better to understand that deep culture, heavy manuring and irrigation are necessary than to have a well-stocked implement house without an appreciation of cultural requirements. Enthusiasm and industry will soon supply all needed tools, though the gardener be penniless at the start.

As commercial conditions are at this time, it is absolutely imperative that soil-workers keep well within their financial circumstances. This can only be done by limiting the hired help to the minimum point and by concentration in cultural operations.

The universal American disposition is to work a ten-acre garden on a five-acre capital ; and American farms are mostly too large. On small gardens and farms the implements and tools would be better, the seeds and seeding would be better, the fertilizing and cultivation would be better, and the resulting crops would be comparatively larger and more profitable. Quality counts to-day for more than quantity in net profits.

A few essentials underlie success in present-day horticultural

tural operations, and the gardener must equip himself as fast as possible with the best and simplest tools and devices for securing these ends. In addition to good seeds, without which nothing can be done, the essentials in gardening are good drainage, deep plowing and thorough cultivation, heavy manuring, irrigation, spraying, and good marketing.

As to seeds, the best plan is to buy of a dealer whose reputation will not permit the sale of anything that is cheap or of uncertain germinating quality.

Drainage, spraying, irrigation and marketing are discussed elsewhere. The use of a subsoil plow is almost unavoidable, and modern invention has put several nearly perfect implements upon the market. The steel-tooth cultivator, which can be set to narrow rows, is indispensable. The manure cart and the market wagon will not be forgotten; and however cheap the latter may be, it must be kept absolutely clean.

The most essential implements, in addition to the above, and besides the usual rakes, spades, etc., are the seed drill and the hand cultivator or wheel hoe. The latter implement is a great saver of time. It is to man power what the diamond point cultivator is to horse power.

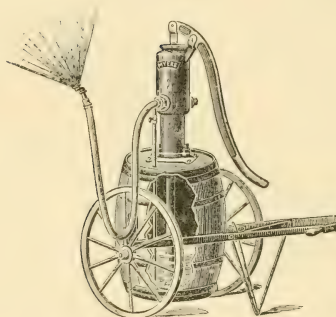
There is no poorer economy than an untidy market wagon, with fruit offered in old, soiled boxes, and vegetables presented in ill-washed or ill-bunched condition.

Soft roll your incense, herbs, and fruits and flowers,
In mingled clouds to Him, whose sun exalts,
Whose breath perfumes you, and whose pencil paints.

—*Thomson.*

CHAPTER VIII.

SPRAYING.



The market gardener as well as the fruit grower has need for the services of the spraying pump, though to a less extent. Here are a few formulæ :

BORDEAUX MIXTURE. Copper sulphate, 4 lbs.; unslacked lime, 3 lbs.; water, 40 gallons. Dissolve the copper sulphate in 6 gallons of water. Slake the lime in as small an amount of water as possible. Mix and stir thoroughly. Dilute to 40 gallons. Use wooden vessels—not iron or tin.

AMMONIACAL COPPER CARBONATE. Copper carbonate, 1 ounce, dissolved in ammonia; water, 12 gallons. (Eau Celeste is prepared in somewhat the same way).

POTASSIUM SULPHIDE. Potassium sulphide (liver of sulphur), 3 ounces; water, 10 gallons.

COPPER SULPHATE SOLUTION. Copper sulphate, 1 lb.; water, 25 gallons; or, water 250 gallons; or, water 500 gallons—giving solutions of varying strength.

PARIS GREEN. Paris green, 1 lb.; water, 250 gallons.

(Not to be used with ammonia solutions, but may be used with Bordeaux mixture). Keep well stirred, as it does not really dissolve.

HELLEBORE. Fresh white hellebore, 1 or 2 ounces; water, 5 gallons.

PYRETHRUM or **BUHACK.** Fresh pyrethrum powder, 1 or 2 ounces; water, 5 gallons.

KEROSENE EMULSION. Soft soap, 1 quart; kerosene, 1 pint; water, 6 to 11 pints. Warm the soap until liquefied; then remove from near the fire, on account of danger from the kerosene. Add the kerosene and agitate violently by stirring, or with a force pump, until a white, creamy mixture has been formed. When the oil is fully emulsified it will not separate from the soap, even after standing. Dilute with water, even up to twenty-five times as much water as kerosene. Do not use the kerosene emulsion on plants of the gourd family—squash, cucumber, melons, etc., as the foliage is liable to injury.

The Bordeaux mixture, the Ammoniacal Carbonate of Copper and Copper Sulphate solution are the best known agents for preventing and destroying fungous diseases, such as rusts, rots and blights; though sulphur is also good.

Paris green, hellebore and pyrethrum are the best known agents for destroying insects which get their food by biting.

Kerosene emulsion is the best known remedy for insects which get their food by sucking. Tobacco water is also an effective remedy for sucking insects.

The practical market gardener is especially concerned with spraying, as it applies to the destruction of insects and the prevention of fungous diseases. Insects are usually contended with after their arrival, while fungous troubles are better anticipated and prevented than cured.

There are a number of excellent spraying machines on the market, for hand power and for horse power. The former vary in price from \$1 to \$20. The horse power spraying devices are more costly.

CHAPTER IX.

INSECTS AND DISEASES.



Plant enemies are of two kinds—insect and fungous. Insects attack vegetables in perfect health. Fungi as a rule attack plants which are either weak or sickly. This rule is not absolute, but it is always true that healthy, vigorous plants have a better chance to overcome their enemies than those which are enfeebled. High culture and quick rotation are therefore the best of all safeguards against insects and fungi, but the gardener must be ever on the alert to check the encroachments of his foes.

Hints have already been given for the preparation of insecticides and fungicides. It is now proper to give a list of the more common insect and fungous enemies, with one or more of the best known remedies, checks or preventives.

The gardener must of course recognize the foe before he can successfully conduct a campaign against it. If it is a biting insect or worm the arsenites or other poison must be used. If it is a sucking insect (having a snout or proboscis for reaching the sap of the plant) it must be attacked through its breathing tubes, on the sides of its body, and a kerosene or tobacco preparation must be employed. If the disease is a rust or smut or rot the trouble is probably fungous in character, and the Bordeaux mixture or other copper solution or sulphur must be used.

The word "insecticide" means something that will kill an insect. The word "fungicide" means something that will prevent or kill a fungus.

The preparation and application of the following remedies demand the exercise of good judgment and common

sense. They must be well made, in order that they may be effective, and their handling must be careful, so that they may not poison human beings or domestic animals.

COMMON INSECT FOES AND REMEDIES.

ANTS. Bisulphide of carbon ; a tablespoonful six inches below surface of ground. Cover with earth. (Keep away from fire ; explosive.)

APHIS, APHIDES, PLANT LICE. Kerosene emulsion ; tobacco dust, tobacco water, tobacco smoke.

ASPARAGUS BEETLE. Paris green ; poultry.

ARMY WORM. Fire ; arsenical spray ; kerosene emulsion ; use of field roller.

BEAN WEEVIL. See pea weevil.

CABBAGE MAGGOT. Carbolic acid emulsion ; bisulphide of carbon in soil (not touching root) ; new location.

CABBAGE WORM. Pyrethrum mixed with flour ; salt water ; air-slaked lime ; catching the butterflies.

CUT WORM. Kainit ; muriate of potash. These are to be plowed or harrowed in. Sweetened bran containing Paris green is a remedy.

CUCUMBER BEETLE (striped). Arsenites in flour ; ashes ; slaked lime ; road dust ; tobacco powder ; turpentine in air-slaked lime.

FLEA BEETLE. Tobacco dust ; wood ashes ; lime ; plaster.

MAY BEETLE. Poultry.

MELON BEETLE. Hellebore.

ONION MAGGOT. See cabbage maggot ; new soil.

PARSLEY WORM. Hand picking ; arsenites.

PEA WEEVIL. Subject mature seeds to temperature of 145° for an hour ; bisulphide of carbon with seeds in tight receptacle.

POTATO BUG. Paris green.

RADISH MAGGOT. See cabbage maggot ; new soil.

ROSE BUG. Spray with Bordeaux mixture to which has

been added Paris green at rate of 4 ounces to 50 gallons. Then immediately dust with fresh pyrethrum. Do the work in the evening. Wash foliage with water next morning. Repeat if necessary, doing the work thoroughly, with strong pyrethrum. (This is Peder Pendersen's remedy).

SQUASH VINE BORER. Catch moths at twilight ; cover fourth joint, so that new roots may be formed ; use air-slaked lime containing turpentine.

WIRE WORMS. Quick rotation of crops.

FUNGIOUS DISEASES AND REMEDIES.

BEAN POD RUST. Copper solutions ; sulphur and water ; new location.

CABBAGE CLUB ROOT. Lime on land—75 bushels to acre ; new location.

CELERY LEAF BLIGHT. Bordeaux mixture ; irrigation of soil to stimulate growth ; new location.

CUCUMBER BLIGHT. New location.

DAMPING OFF. Ventilation ; new soil ; new frames or staging ; lime.

LETTUCE ROT. See Damping off.

ONION RUST. New location.

POWDERY MILDEW. Bordeaux mixture.

POTATO BLIGHT. Bordeaux mixture ; clean seed ; new location.

POTATO ROT. Sulphur ; Bordeaux mixture ; clean seed ; new location.

POTATO SCAB. Sulphur ; new location ; seed treated with corrosive sublimate.

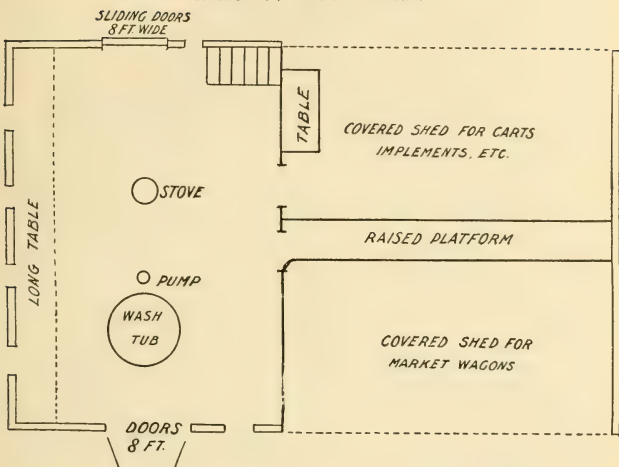
SWEET POTATO BLACK ROT. Sulphur ; copper solution ; new location.

TOMATO BLIGHT. Bordeaux mixture.

TOMATO ROT. Bordeaux mixture.

CHAPTER X.

A MODEL TRUCK HOUSE.



GROUND PLAN OF TRUCK SHED OR VEGETABLE HOUSE.

(Closely modelled after a structure belonging to Thomas Brooks, Jr., Philadelphia. Size about 36x56. Raised platform under covered shed is open toward market wagons, but on the other side there is a board partition, separating the two sheds.)

Comfort, convenience, utility—these are the requisites of the truck house or vegetable shed of the market gardener. The cut or engraving shows the ground plan of a Philadelphia trucker's place of business. There is a second story to the building reached by the stairs in the main room, and there is not an inch of lost space anywhere.

This ground plan is a rough drawing of the vegetable house of Thomas Brooks, Jr., in the northern part of the

city, near Richmond and Venango streets. The building, like the whole place, is planned for convenience. The main room is heated in winter by a stove. There is a pump, with a large tub or tank for washing vegetables. There are windows to admit light, tables for bunching, and hooks for the garments of the workmen. Two doors open out under covered sheds—one shed for the incoming carts or barrows bringing vegetables from the garden; the other, for the departing market wagons with their loads of washed, bunched and barreled succulence.

The Brooks garden or truck farm has many broad acres devoted to the production of cabbage, beets, lettuce, thyme, kohl-rabi, celery and other things. It is laid out on rectangular lines, in blocks containing from less than one to several acres, and worked to its utmost capacity.

HEATING A WORK ROOM. A small hot water stove can be arranged so as to distribute the heat more evenly than a stove, and by keeping a banked fire enough heat is generated to prevent the shed from getting very cold at times when not in use. It is also a benefit for supplying hot water for use in washing. The system can be put up for from \$20 to \$30, including the equipments. It can be attached to a tank or to the city main, and the hot water drawn the same as from a range boiler in a house. The advantage of such a system is that the heating pipes can be placed in any part of the shed, even a second story, and the heat supplied just where wanted, and not confined to a single distributing point as with a stove.

CHAPTER XI.

MARKETS AND MARKETING.

A Dreer note-book memorandum made in Rhode Island in 1896 is highly significant—and has a moral. The Rhode Island growers, it must be remembered, have great markets in two directions, aside from their local centres of population. The “note,” though crude, is self-explanatory.

“Boston pays better prices; 20 per cent. higher than New York. Boston stuff must be fresh and handsome. New York will take anything.”

This comment, from the lips of a Yankee farm gardener, is not meant to cast a reflection upon the great New York markets, but to emphasize the fact that things which are “fresh and handsome” will always and everywhere command higher prices than goods carelessly marketed.

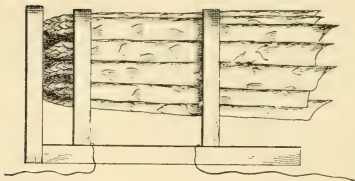
It is probably true that the Boston markets are more discriminating than the New York markets, but the main idea is that good vegetables must be presented in good parcels in order to command good prices.

The man who sells poor garden stuff takes the market price, or less. The man who puts his products in extra fine order can sell them for extra prices—always.

PART II.

CHAPTER XII.

ASPARAGUS CULTURE.



HOME-MADE ASPARAGUS BUNCHER.

Philadelphia market gardeners generally prefer a green-colored rather than a purple-colored asparagus. They set out one-year-old or two-year-old roots in about equal quantities, some growers demanding the former and some the latter. They say that city stable manure is the best known main fertilizer for asparagus. They set the rows four to five feet apart, with plants two feet apart in the rows, working the furrows a foot deep with the plow, followed by a shovel. They bunch the asparagus, ship it in ventilated berry crates, and consider it a profitable crop, even at present prices, which are somewhat reduced as compared with former quotations.

Such, in brief, is a summary of the Dreer field notes of 1896.

VARIETY, AGE, DISTANCE, DEPTH. Beginning with the comment of an expert grower, that half the battle is to start with the right variety of asparagus, it may be said that Philadelphia gardeners usually prefer the light-green mammoth strain which is now sold under the name of Eclipse.

The same "grass" has other trade names, and a number of local titles beside, as more than one grower claims the honor of introducing it to the general market.

The Eclipse is, of course, an evolution ; and, as many cultivators have grown asparagus on practically the same lines for long terms of years, it is quite likely that more than one person has developed this excellent strain.

Asparagus does not invariably seed true to name, and there will always be some purple shoots in a field of Eclipse, or any other green variety ; but the color is now pretty well under control.



PARTS OF ASPARAGUS BUNCHER. (See p. 40.)

As to age of roots for setting out, there is a wide difference of opinion among practical growers. The truth is, doubtless, with both sides, and may be resolved into the general advice to plant two-year-old roots in gardens and small plantations, and strong one-year-old roots in large plantations, where the older roots would be too expensive. A strong one-year-old root, under the best management, will nearly equal the average two-year-old root in time of reaching maturity ; but fresh, well-selected two-year-old roots are best where quick results are demanded.

The distance between the rows, in the practice of the Philadelphia market men, is from four to five feet, on the average. The plants are set from two to three and one-half feet apart in the rows—the latter distance when extra large asparagus is wanted.

The asparagus bed must be on deep, rich, mellow soil ; preferably with gravel subsoil. If such a situation cannot

be had the land should be thoroughly underdrained, in order to facilitate the operation of the manure that must be so lavishly applied to the soil. Where the drainage is poor the manure is washed off the land, instead of into the land, during heavy rains.

After the ground is in thorough order, with anywhere from 25 to 100 tons of rotted horse manure plowed under, rows the required distance apart are made with the plow, the plow being run both ways in the furrow. A shovel further deepens the furrow, at last securing a depth of perhaps a foot below the natural surface of the field.

This distance or depth is variously estimated by truckers, some claiming it to be eighteen inches, while others say it cannot be more than nine or ten. The sloping sides of deep furrows are deceptive in this respect, and it is probably true that the plow and shovel method never gets more than a foot below the natural surface of the soil.

Any expert plowman will see how to turn double ridges the required distance apart, and to leave "clear up furrows" just where the asparagus roots are to be set.

Some growers put a thin layer of well-rotted manure, covered with soil, in the bottom of the trench, for the reception of the roots. Others trust wholly to the well-enriched soil of the whole bed.

In some private gardens the laborious practice of digging deep trenches with spade and shovel is still followed, but this custom is fast disappearing, as it is too expensive.

In passing it may be said, in reference to the depth of asparagus roots under the soil, that shallow planting produces earlier but smaller shoots. Deep planting yields later but larger shoots.

TREATMENT OF YOUNG BEDS. No crops are advisable for a young asparagus bed during its first year, since it is good practice to keep the cultivator constantly running. The deep trenches must be slowly and steadily filled up as the

asparagus shoots gain size and strength ; and as the earth between the rows must be constantly disturbed in order to fill the deep furrows there is but little chance for cropping.

Sometimes a late crop, like turnips, is put in during the latter part of the first year ; and during the second year crops of tomatoes, corn, etc., may be grown. A few market gardeners crop their asparagus beds permanently, getting lettuce, radishes or spinach in the early spring. As a rule, however, it is better to look to the asparagus bed for nothing except asparagus.

The second year after setting the roots, often called "the third year," is the time for beginning to cut the young shoots. Cutting must cease early, say the first of June, in order not to exhaust the young plants. Old, well-established beds are safely cut for another month.

FERTILIZING. Nobody need fear to put rotted horse manure on asparagus beds. It may be used up to any desired amount, but as the gross sales of asparagus will not be likely to exceed \$200 to \$250 per acre, under the most favorable circumstances, there is an economic limit in manuring which must not be exceeded. A fair acre average for the Philadelphia gardeners may be quoted at 15 tons of stable manure and 500 or 600 pounds of complete fertilizer, though the fertilizer is not always in favor ; with perhaps half a ton of salt and half a ton of kainit, or either. Kainit contains more than one-fourth its bulk of salt, and a considerable percentage of potash ; otherwise it has no value as a manure. It is not to be recommended for use with salt, as it takes the place of salt and yields potash besides.

CUTTING AND BUNCHING. The illustrations show a very common, home-made asparagus buncher in use among Philadelphia truckers. It is made of strong inch board, the parts being well nailed together. Some growers use a quart cup or large tin fruit can for bunching purposes. It is tied

with string or raffia ; two strings at the small or tender end of the bunch and one string around the butts. The butts are afterwards cut off square with a long knife. Wet string is often used, as it is softer and more pliable.

Asparagus is cut from the bed with an ordinary butcher knife, or with a knife especially prepared for the purpose. The latter implement is for deep cutting, where the underground portion is wanted. Care must be taken not to injure with the knife other shoots under the ground. The size of the ordinary bunch may be judged by remembering the size of the dry-measure quart cup, which is sometimes used as a buncher.

It is the usual practice to cut during the morning, bunch and tie during the afternoon, and send to market the following day, the asparagus having been placed in water during the night.

Asparagus is frequently assorted and sold in three sizes, the better prices obtained for the finer shoots offsetting the labor of the operation. It is often shipped to market in open fruit or berry crates. In this condition it suffers somewhat from drying, but can be made fresh again with water. In tight boxes or packages it is in danger of "heating" on its way to the city markets, especially if subjected to delay.

Some successful growers put their bunched asparagus in cold storage for a day or two before shipment ; then ship in closed packages. This prevents heating as well as drying.

SELLING. The first home-grown asparagus in the Philadelphia market sometimes commands \$1 per bunch, or three bunches for \$2, wholesale. The average wholesale price for a really good article during the season of 1896 was about "10 bunches for a dollar." At this rate the growers found a margin of profit in the business.

As already stated, the gross receipts from an acre of asparagus will not exceed \$150 to \$250 per year. This is based on an estimate of 1500 bunches of asparagus to the acre.

RIDGING. The "ridging" of asparagus is an important cultural feature. It consists in turning furrows with the plow on both sides toward the row. In effect, it puts the roots further under ground than before, and results in slower growth and larger "grass"—as the gardeners invariably term their asparagus shoots.

It is sometimes the custom to ridge for winter protection, working the ground level in the early spring, to encourage quick growth. But the great use of the ridging plan is in late spring, after the weeds have begun to grow and after the asparagus has begun to spindle. The plow buries the weeds and checks for a time the appearance of the shoots; then they advance in greater strength than before. The gardeners say it is because of the cooler ground thus afforded them.

To produce unusually rank, large shoots it is only necessary to heap the earth deep about strong asparagus crowns, and to continue the operation as the shoots push upward. The process may be made successful as long as the terminal bud of the growing shoot shows no sign of bursting. The shoot finally seems to get impatient, and will go no further; but the gardener has the material for making a bunch of asparagus perhaps two feet in length. This is not good commercial work, however, except for special purposes. Daniel Starkey, of Bustleton, is quoted as having once produced a "bunch" of asparagus in this manner, containing 56 stalks, which weighed 70 pounds.

OTHER POINTS. Beetles are conquered with Paris green, with poultry, by hand-picking, or not at all. They are annoying, but at Philadelphia are not considered very formidable. Paris green in flour or plaster is often used on the yearling plants, but the older plants are usually permitted to take care of themselves.

Crooked asparagus shoots probably result from several causes. A hard crust on the soil will, it is believed, some-

times turn a shoot sideways. The cut of a knife or the bite of an insect may produce an injury resulting in lateral growth. Other causes no doubt result in these undesirable shoots.

Asparagus tops ought to be burned in the late fall or winter ; unless some good way can be devised for using them as litter or manure savers. They are so full of seeds, however, that it is doubtful whether it would be economy to employ them for litter.

In New England, in some places at least, asparagus is sold by the pound, without bunching. An 1896 quotation was 10 cents a pound, which to the grower was quite satisfactory. The cost of bunching is considerable—at least a cent a bunch.

FOR FORCING. For forcing purposes, to be covered with sashes in the early spring, as described in Dreer's *VEGETABLES UNDER GLASS*, the roots must be set near the surface of the ground—say only 5 or 6 inches deep. This is because early growth is demanded.

AN OLD GROWER'S EXPERIENCE. Robert Nichols, of Bustleton, well known among Philadelphia gardeners, says that asparagus never elsewhere yielded for him so largely as in seven single rows which he set out eighteen years ago in certain clear-up furrows in his garden. With the plow a depth of six inches was secured, and with the spade an additional depth of ten inches. The plants were slow in making their appearance, and the cutting for several years was small ; but the subsequent cutting was nearly double in amount the yield of any other asparagus on the place. Mr. Nichols says there is no danger of getting the roots set too deep. He believes in horse manure, but has less faith in artificial fertilizers for asparagus.

CHAPTER XIII.

CELERY CULTURE.



A FIELD OF GOLDEN SELF-BLANCHING CELERY.

J. Milton Berger, Jamaica, Long Island, October 30, 1896.

In Japan, where dwelling-houses are not heated during the winter season, the natives clothe themselves according to the temperature. When the mercury stands at 60° a Japanese man is comfortable when wearing one komono, or long garment. When the temperature falls to 40° he puts on another komono, and a third if 20° is reached.

The Japanese custom suggests the proper plan for preserving celery in winter storage—the greater the cold the greater the protection, with the extra “komono” thrown off if warm weather should occur in midwinter.

The problem in the changeable American climate is to adapt the protection to suit the weather, and large amounts of stored celery are lost every winter in this way. Good judgment and prompt action will in most cases prevent this loss.

A LATE OR SECOND CROP. Celery is usually grown near Philadelphia as a late or second crop, in ground that has been devoted to something else early in the season. The market gardeners here begin to set out celery in June, and continue to plant until August. The ground cannot be too rich, and a heavy coat of rotted manure should be spread before plowing for celery. If water can be had for irrigating purposes it is safe to use a complete fertilizer to the amount of one thousand or even two thousand pounds per acre, in addition to the manure. But if artificial irrigation is impossible it is better to use a smaller amount of fertilizer.

VARIETIES AND SEEDING DATES. Of the varieties now most used at and near Philadelphia may be mentioned Golden Self-blanching, White Plume, Pink Plume, Giant Pascal, Perfection Heartwell, and Golden Half-dwarf. A dozen other kinds, or these kinds under other names, are also used. The dwarf or half-dwarf kinds are used almost exclusively. Beginners cannot do better than to trust the judgment of an experienced seedsman in the selection of sorts.

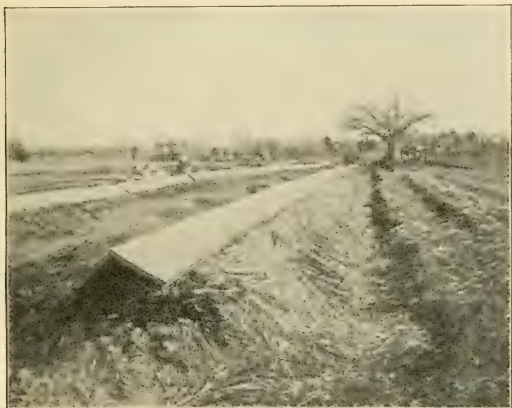
There is, it is true, a choice in the matter, as every soil and every market has its own peculiarities, which the grower must recognize ; but until a comparative test has been made the grower must trust the seedsman. The firm selling the seeds will recommend those sorts which have been most widely successful.

Celery seed may be trusted in the open border in April, or even in March. It is slow to germinate, and the sooner the work is done the better. The plant is naturally hardy, with a decided preference for cool weather, and soil moisture is essential to its germination. If sown later in the season, say in May or June, constant watering will be necessary.

The seed must be scattered in rows, rather thickly, and kept almost on the surface. A good plan after digging and raking the soil is to lay down a narrow board or strip of

wood, strike it with a brick, scatter celery seed on the even surface thus secured, sift a sixteenth of an inch (or less) of the finest loam upon it, and again firm the place with the wooden strip by means of a blow with a brick or hammer.

When the young plants have made their appearance they must be kept clear of weeds, occasionally cultivated, and watered if necessary. When a growth of six or eight inches



WINTER STORAGE OF CELERY IN PRIVATE GARDEN.

William Robertson, gardener to John W. Pepper, Jenkintown, Pa., January 6, 1897.

has been made it is well to begin to cut back the tops, to the extent of an inch or two, in order to strengthen the roots. The heart of the plant becomes much stronger if thus exposed to the sunlight.

In small operations the celery plants are frequently pricked out or transplanted from the seed bed to an intermediate bed before going to the open garden. In large patches this intermediate work is avoided on account of the labor

and expense, the same result being secured by extra good care of the seed bed and extra heavy manuring of the ground in which the crop is grown.

SETTING OUT. The wide-awake operator considers a garden line a time-wasting device when celery is to be set out in a hurry. He anticipates a midsummer shower, and makes ready beforehand. The ground is manured, plowed, harrowed and rolled, and made as fine and smooth as possible. A line is then stretched and a wooden marker used for making rows. After a straight mark has been secured the garden line is no longer necessary, as the marker follows its own path, each time locating for itself a new row. When the work is complete the patch is wholly covered with parallel furrows an inch or two in depth, and three feet (or four) apart. A shower of rain does not obliterate these marks, and the celery planters follow them very rapidly.

DATES FOR SETTING. July is usually the month for setting out fall or winter celery, the early crops being off the land by that time and the ground being available. If the soil is in extra good order, and if a water supply can be controlled, so as to render heavy fertilizing entirely safe, the setting out of the celery may be deferred until early August. But July is usually the better month.

The proper distance between rows is three feet for the dwarf kinds and three and one-half or four feet for the half-dwarf varieties. At these distances celery must either be sold directly from the field or lifted and taken elsewhere for winter storage.

If the celery is to remain all winter in the original rows, as now quite generally practiced in private gardens, a different method of setting is observed. Double rows are planted ten or twelve inches apart, with say twelve-foot intervals between. This is to allow for the soil needed for winter covering, which is quite a large quantity, as shown in the illustrations.

Still another method of planting celery, which has had some attention recently, is in a closely-set bed, each plant having say six by eight inches of space. The claim is made that in rich ground, with an abundant water supply, a prodigious crop can thus be secured, and that the dense shade resulting from rapid growth produces a satisfactory bleaching of the stalks.



BLEACHING CELERY WITH BOARDS.

J. Milton Berger, Jamaica, Long Island, October 30, 1896.

We have seen this method tried, but not yet with very good results.

Celery plants are often set between rows of sweet corn, while the corn is still standing, or among cabbages or other crops. In the case of corn every row is occupied, while between closely-planted cabbages every other row is set with celery. The temporary shading by the corn is rather beneficial; though nothing can be an improvement on well-prepared open ground, with good cultivation and sufficient moisture.

IRRIGATION. Wherever ground that is deep and rich can be put in good order a crop of celery is reasonably certain, especially if irrigation can be commanded. The time has arrived in America when intense culture is essential to success, and the highest culture is impossible without good drainage, heavy fertilizing and a reliable water supply.

The end and aim of irrigation is to remove the uncertainties of the weather ; to make it safe for the cultivator to stimulate his plants up to the highest limit of their assimilative capacity. In no other way can profits be counted upon in advance.

There are many meadows in the country adjacent to Philadelphia exactly suited to celery growing, and so situated that natural brooks could be led to any part of them. Such meadows will furnish the best market gardens of the future.

CULTURE AND BLEACHING. The horse cultivator has the same duty in the celery patch as elsewhere in the truck garden, and it pays to keep the soil thoroughly and constantly stirred. The celery makes such a growth by September that "handling" is needed, and loose soil must be available for this purpose. "Handling" is the process of bringing the spreading leaves together and packing soil about them, to encourage a compact, perpendicular growth. Sometimes this handling is followed by the turning of a light furrow toward the row with a plow ; or a celery hiller, with leaf-lifting attachment, is passed along on both sides of the rows. These processes will bleach the dwarf sorts, such as Golden Self-bleaching and White Plume, and render them speedily fit for market.

Another method of bleaching is by means of boards. This system is used with the dwarf as well as with the half-dwarf sorts, and produces stalks of ivory whiteness. The method of using the boards is shown in the picture. Stakes

hold the lower edges of the boards in place, while the upper edges are clamped together with small iron hooks made of stiff wire.

The old way of banking high with earth by means of a spade or shovel, to secure autumn celery for the table, is still sometimes followed by amateurs and private gardeners, but not much by market growers.



WINTER STORAGE OF CELERY IN PRIVATE GARDEN.

Thomas Dwyer, gardener to Dr. J. A. DaCosta, Villa Nova, January 4, 1896.

STORAGE. The important points about celery are yet to be told, for it is in the matter of storage that so many people fail. The main trouble was mentioned at the opening of this chapter. The stored celery is either frozen or smothered in the trenches; either permitted to freeze solid or allowed to rot from heating or other cause.

Celery is a very hardy vegetable, and is not in the least injured by the heavy frosts which occur before the 15th of

November. The freeze which so often occurs within two or three weeks after that date, when the mercury drops below 20° , should be avoided; that is, the celery should be protected against it.

But in the case of warm December weather, which is not unusual, the celery tops should again be exposed to the air. This is a parallel case with the native of Japan and his komono.

All celery that has been lifted from its place of growth is more liable to decay than that with roots undisturbed—which brings us to the two main systems in local favor for winter storage of celery.

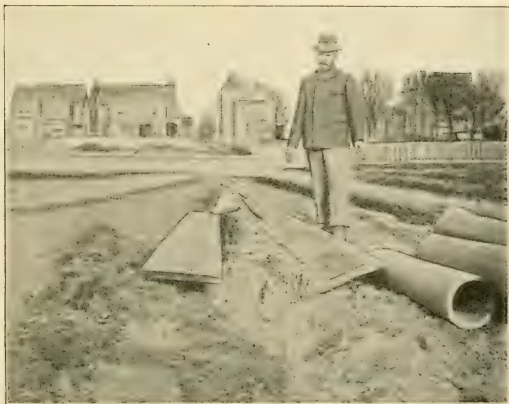
One system is that which is followed by private gardeners and large public institutions, where the necessity of reaching the stored celery in bad weather is not imperative. In this system the celery is stored just as it grows and where it grows.

The other system, practiced more by market gardeners with retail trades, makes provision for getting celery out of storage, in any sort of weather, at regular stated intervals. Here the celery is lifted, and packed in close quarters in trenches, the covering being movable.

Both ways are shown in the pictures in this article. In the double-row case the relative height and thickness of celery, earth and leaves are revealed in the illustration. Here the celery cannot be ventilated, owing to the way the earth is put on. But as it stands on its own undisturbed roots, with no spaces about it for the accumulation of foul air, there is less need for ventilation than where it is lifted and afterwards packed.

In the case of Max Meyer, while the stored celery is wholly under ground, the method of ventilation is easy and complete. The tops may be fully exposed to the air on an hour's notice. The celery keeps all winter. Mr. Meyer's storage box or trench has board sides, and is one and one-half feet deep and one foot wide.

WATERPROOF PAPER. This substance is now used largely by market gardeners for the autumn protection of celery. It has both rain-turning and frost-turning ability. It is sold in long rolls, and is used but once. It is not expensive, and is very convenient and effective.



CELERY STORAGE BY MARKET GARDENER.

Max Meyer, West Chester, Pa., December 7, 1896.

[NOTE.—The celery tops are imperfectly shown between the two boards. The boards, when turned together, cover a sunken box which is 1 foot wide and $1\frac{1}{2}$ feet in depth, and is filled with closely packed celery.]

DISEASES. Celery is not subject to many diseases or enemies. The parsley worm sometimes attacks it, but not to a disastrous extent. It is liable to rust or spot if handled when wet, which leads growers to do all their work with it during dry weather. There is a yellow blighting of the lower leaves, sometimes, which is objectionable. For this trouble the best remedy is perhaps to be found in irrigation, for the blighting is worse in dry weather, and is by some

growers thought to be altogether the result of drouth. Rapidly-growing celery is subject to but few ailments, and is tender, succulent and sweet.

PRICES. Prices have been low for some years past, owing to several causes; principally the excessive production of certain great celery-growing and celery-shipping centres. The transported product, however, is never quite so good as the home-grown article, and will never entirely drive it out of the market. For retail trade home-raised celery will always be an available crop, and its merits will ever cause it to be in demand.

THE OLD WAY. The old trench system of growing celery is no longer widely followed. It is slow, laborious and expensive, and productive of no better roots or stalks than the modern system of surface planting.

A PLANTING INCIDENT. On Sunday, the 14th of June, 1896, there was a fall of rain at Philadelphia. On Monday morning, June 15th, John Davis, a market gardener in the northern suburbs, started to set out his early celery. His patch (an acre, perhaps) had been made ready beforehand. Four men were employed in planting, while four boys dropped the plants. Two of the men were on their knees; the other two worked by bending at the waist, and literally walked along the rows as they set the plants. All the planters were expert, but those who bent at the waist (an almost impossible attitude) made the greatest speed. The four planters were all getting up close to the 1000-per-hour mark. Wooden dibbers with brass points were used.

CHAPTER XIV.

LETTUCE CULTURE.



SILVER BALL.

Quality in lettuce depends upon crispness and succulence, and these in turn depend upon quickness and vigor of growth. The requisites are good soil, good culture and sufficient moisture. The ground cannot be made too rich for lettuce, for it is desirable to secure heads in a few weeks from the set-

ting out of the young plants.

The lettuce belongs among the plants which are grouped under the name of The Composites, in Chapter XXIV. of this book. It is to-day one of the gardener's best money-makers, as it is in demand during the entire year.

It belongs among the hardiest garden staples, and is naturally better suited to the cooler months than to the heat of midsummer, though the unceasing demand for it has prompted the development of heat-resisting strains. Different sorts are planted at different seasons, but otherwise the succession is unbroken.

In many localities the demand for lettuce is still confined to the spring months, but this salad-making vegetable is apparently gaining favor everywhere, for it is grown in greater abundance each year.

Two other factors, beside improvement of the home product, have helped to increase the consumption of lettuce at Philadelphia and New York. One of these factors is the

Southern product, which is barreled and sent here in perfect order, and the other is the Eastern lettuce, which arrives in quite as good shape.

It seems paradoxical for the South and the East to compete with each other for the lettuce and cucumber trade of Philadelphia and New York, but such a competition now exists. The Southern states are doing excellent garden work in the open air during the cool months, while the great glass-covered gardens of New England send their overflow supplies of lettuce and cucumbers to the two large cities of the middle Atlantic seaboard.

But notwithstanding the "foreign" lettuce which thus reaches Philadelphia, the market here is yet a good one for home producers. The prices are lower than formerly, but there is still a profit on a good article.

SOIL PREPARATION. Lettuce demands a rich soil, for the reason given at the outset of this chapter. It is a common practice to sow the seed in a border or small bed, for starting the plants, so as to save the time of the open garden. The "squares," or patches of open ground intended for lettuce, are put into the finest and richest condition, and then marked out both ways in lines a foot apart. Young, well-started plants are set where the lines cross; or the young plants may be set in rows two feet apart, to be worked by horse power. Where ground is high in price the former plan is preferable, as it yields twice the quantity of lettuce, though involving more hand labor.

VARIETIES. Among the best winter varieties of lettuce (other than the forcing kinds) are the Early White Cabbage or Dutch Butter, the Early Dutch Butter Spotted, and Big Boston. These are nearly frost-proof, and are used in cold frames, on ridges in the open air, and in borders. Others are nearly as hardy. If sown about the middle of Septem-

ber, and protected with a little straw, they will (in most places) go through the winter safely, and be available for transplanting in the earliest spring. Or they may be headed in their winter quarters, as the removal of the light coat of straw and the use of the hoe will encourage a quick growth.

There is no dividing line between the winter and summer cultivation of lettuce, and the reader is referred to the little book recently issued by this house entitled *VEGETABLES UNDER GLASS* for a description of cold-weather methods. The winter forcing of lettuce is now an industry of wide importance, in which much capital is invested.

The warm-weather varieties of lettuce (some of which are used for winter forcing) are numerous. Many newly-named old friends are offered to the public every year. Some of these "novelties" are real horticultural acquisitions, being genuine improvements of old types; others are merely old wine in new bottles—and the buyers pay well for the bottles.



THE COS TYPE OF LETTUCE.

The standard open-air sorts include Silver Ball, Black-seeded Simpson, Salamander, Dreer's Improved Hanson (on the market over twenty years), and Yellow-seeded Butter. Sensation, a recent "novelty," is much like Salamander; and Champion Spring and Summer is the same as Yellow-seeded Butter. All are good, reliable types.

The Cos type of lettuce is shown in the engraving. Its shape is quite peculiar.

There are other novel lettuce shapes to be found pictured in the catalogues of the seedsmen. Most of them have merit.

PRINCIPAL SOWING DATES. The principal dates for sowing lettuce seed at Philadelphia may be set down as September 15th, for plants to "winter over" either in cold frames or under straw protection; October 15th, for plants to "winter over" in frames, without heat, to give a spring succession; February 15th, in frames, without heat; and at the earliest possible day in the open border, with successional out-door sowings, to keep up the supply of young plants throughout the spring and early summer months; and, indeed, running into autumn, to cover the whole year. The time to sow lettuce seed is, therefore, practically always, except when the ground is frozen.

All gardeners have more or less "glass," as they term their sashes collectively, and in most cases a few sashes with heat; or there may be one or more greenhouses. The control of heat of course permits the gardener to sow lettuce seed at any time during the winter.

TRANSPLANTING. It is always good practice, when feasible, to transplant or prick out young lettuce plants, removing them from the seed bed, separating them, and giving them a chance to increase the root system before setting them in permanent quarters. This is not always done, and its utility is in all cases a question of expediency, to be determined by actual comparative trial.

In all sowings in warm weather it is regarded as best to put the seed where the plant is to remain, as transplanting is then difficult. Several seeds are usually dropped at each point, and the superfluous plants afterward weeded out. This plan is also followed sometimes in the early spring sowing of lettuce seed in cold frames.

It requires from three to four weeks, in summer, to get young lettuce plants from seed; and from three to six weeks to head them, making a total of six to ten weeks from seed

to maturity. Speed and profits being closely related, it is of course desirable to push the lettuce growth up to its maximum limit.

INTENSE CULTURE. In order to make the most of his highly stimulated ground the gardener frequently divides his best land up into what he calls "squares." These sections are square only in their angles, as a rule, being usually longer than wide. They permit of the best and most careful culture, and make the regular "rotation" of even a small piece of ground quite feasible.

MARKETING. The preparation of the lettuce plant for market involves but little labor. The root must be cut off, the lower leaves removed if they are yellow or rusty, the head passed through clean water, and then put carefully into a ventilated box or barrel. About 70 heads of lettuce, on the average, fill a barrel. If pressed firmly, without mashing, the lettuce will carry in prime condition, and will remain sweet. The shipping should involve no delay whatever, as lettuce is best when perfectly fresh.

Prices of lettuce are not high; about \$2 to \$3 per hundred, wholesale, during the spring and summer of 1896. Retail prices were perhaps double these figures, as the article is perishable.

It should be remembered that during periods of over-production, making a glut in the market, prices always fall, while the opposite state of affairs makes abnormally high quotations. Boston lettuce has been shipped here during periods of winter scarcity, and sold as high as \$10 per barrel, wholesale; while, on the other hand, lettuce sometimes begs for buyers at \$1 per barrel. It requires good judgment to measure the market in advance.

DISEASES. Out-of-doors lettuce is often troubled with aphides or green lice. These insects are easily washed off

when the lettuce is cleaned. Mildew sometimes attacks the lower leaves, but it is more common in the under-glass crop. "Damping off" is often serious in cold frames, where the soil has been used several times, or where the wood-work is old, but is seldom troublesome in the open air. Rapid lettuce growth is the best remedy for all diseases, with an occasional change of soil.

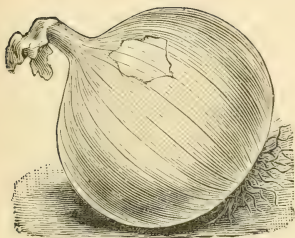
RIDGE CULTURE. This system, while altogether an open-air operation, is so intimately associated with winter work that it received attention in *VEGETABLES UNDER GLASS*, lately issued. It is a plan for setting September-started plants on ridges made with a plow, say in October; the ridges to be twenty inches apart and the plants about ten inches from each other. The lettuce takes root before the arrival of severe freezing weather, and is covered with straw or salt-hay in winter. It makes heads quite early in the spring. Sometimes one row of lettuce is set on a ridge and sometimes two rows. The White Butter is the kind mostly grown in this manner. It is especially hardy.



PRINCESS PLOW.

CHAPTER XV.

ONION CULTURE.



PRIZETAKER ONION.

The onion is botanically a lily. Its root is a bulb, made up of successive layers or scales. It is naturally hardy.

The simplest way to grow onions is to buy the sets in the spring, and plant them just under the surface of the soil, as soon as the ground can be worked.

The next advance in onion cultivation is to raise them from seed, which is an operation usually requiring two years.

The latest method is to produce full-sized onions the first year, direct from seed, by transplanting.

The onion may be grown for several successive years on the same soil, if fertilized each year, as it shows less need of "rotation" than most of our garden crops. It delights in rich soil, cool weather and high culture. Hot, dry weather quickly checks its growth, causing it to ripen. The top dies, and for a time the bulb lies dormant; but if left in the soil it is liable to begin a new growth after a rainfall.

Success in storing onions depends mainly upon ripening them thoroughly and then keeping them dry, with the least possible atmospheric change. They do best when spread in thin layers, in shaded and well ventilated places. They must never be handled when frozen; and it is important not to bruise them when moving them from the field or afterward.

TYPES AND VARIETIES. In Farmer's Bulletin No. 39 (Watts, U. S. Dept. of Agriculture) onions are divided into two great groups, American and foreign.

The American group includes the different kinds of Wethersfield, Danvers, Strasburg, Southport, Silver Skin, Perennial or Egyptian, Potato or Multiplier, Shallots, etc.

The foreign group includes the different strains of Bermuda, Rocca, Victoria, Prizetaker, Barletta, Tripoli, Pompeii, etc., including of course those sometimes termed Spanish onions and Italian onions.

As a whole the onions of the American group are better keepers, though stronger in flavor. The foreign onions are milder and sweeter; and are more generally raised directly from the seed the first year.

Merit in an onion, by present standards, demands a globular shape, a compact and firm bulb, with thin skin and small neck. It must be of good appearance, mild flavor, productive and a good keeper.

Of the American group the Perennial onion, the Potato or Multiplier onion, and the Shallot onion vary from the common type in certain respects.

PERENNIAL OR TREE ONION. The Perennial (often called Egyptian or Tree or Top onion) lives more than one year, as its name implies. It throws up a stalk and produces small bulbs at the summit, instead of flowers and seeds. It does this year after year. These terminal bulbs if planted will in turn produce large onions. This variety is often used for scullions, as it is extremely hardy, and remains green all winter. The clusters of bulblets are sometimes broken apart, or they may be planted entire. Our note-books have a memorandum, made on Long Island, October 30, 1896, of a large patch of scullions consisting wholly of Perennial onions, the bulbs having been separated and planted about three inches apart, in rows a foot apart. (Any onion planted in

the fall to produce early spring shoots is called a scullion, and the name is also applied to the young shoots themselves. The word is more properly written scallion). The Perennial is very strong in its flavor, and is not considered one of the best onions.

POTATO ONION. Potato or Multiplier onions increase by division of the bulb. A small bulb planted in spring will produce a large bulb in a comparatively few weeks. A large bulb planted in spring will, by division, produce from six to ten small bulbs. This onion is much planted in the South in autumn for scullions. It is grown in the North as a summer onion, to some extent. Large specimens of it (the yellow variety) were noted in Rhode Island in July, 1896. It is said to be free from attacks of maggot, but is liable to some other troubles. To perpetuate the stock the practice is to plant large onions and small bulbs at the same time.

SHALLOTS. Shallots resemble Potato onions, but throw up an occasional seed shoot. The bulb always multiplies, even when small, which is not the case with the Potato onion. They are extremely popular in the Southern States, and can be successfully grown in the North. In the South Shallots are planted in August or later; in the North in the spring. They must have room to multiply, and are set ten inches apart in rows twelve inches apart. They are taken up in June or July (in the North), and stored in a cool place, and treated like onions. The Shallot is not perennial, as the original bulb dies and disappears after producing the surrounding sets. The average size of the Shallot is about equal to a walnut. It is oblong in shape. It holds a high place in the esteem of good cooks, as it has great flavoring merit. Its growth does not require a long season.

FERTILIZERS. Chemical analysis of the onion gives the best possible clue to a wise system of manuring for the crop.

The Connecticut Experiment Station has found that 800 bushels of onions (56 lbs. to the bushel) take from an acre of soil over 60 lbs. of nitrogen, over 20 lbs. of phosphoric acid, and over 46 lbs. of potash.

The best and cheapest (slow) source of nitrogen is Crimson clover ; the best quick source is nitrate of soda, of which 200 to 400 lbs. per acre should be used, to be applied in the spring.

Wood ashes is recommended for potash ; or 200 to 300 lbs. per acre of muriate of potash.

One hundred pounds of ground bone per acre would supply the necessary phosphoric acid. Barnyard manure, well rotted, is always advisable. Hen manure is in high favor with onion growers, especially for use after planting.

John Repp, of Glassboro, New Jersey, who grows onions and onion sets on a large scale, uses a ton of complete fertilizer per acre, without manure, on a gravelly loam ; and for growing onion sets he sows 40 lbs. of seed to the acre.

SEEDING. The seed should be used at the rate of six pounds to the acre for growing large onions in the open field. It should be put about half an inch below the surface of the soil, with a drill, in rows twelve to fourteen inches apart. The onions should be permitted to stand three or four inches apart in the rows. The cost of the seed is but a small item, when compared to the cost of labor and fertilizers, and none but the best seed should be used.

TRANSPLANTING. The Philadelphia market gardeners have learned that it pays to transplant onions, as they can in this way be grown in perfection from seed in a single year. Red Wethersfield, Yellow Danvers, Southport Globe, Prize-taker and other sorts are grown in this way. The seed may be sown in the open border as soon as the ground can be worked in the spring ; or as early as March in a cold frame, or still earlier in a hotbed. It requires about six weeks to get onions fit for removal, even with some heat.

Watts in Farmers' Bulletin No. 39 recommends the rows under glass to be three inches apart and one inch deep, and the seed to be sowed at the rate of $1\frac{1}{4}$ oz. to the sash. The tops and roots of the young onions are to be somewhat trimmed at transplanting time, and they must have plenty of air previous to their removal, in order to harden them. The advantages of transplanting are saving of time, increase of yield and uniformity of size, resulting in better profits. Onion seed sowed the first of March, and transplanted, will produce bulbs three inches in diameter by the first of August, under good treatment.

CULTURE. The cultivation of growing onions with a wheel hoe (or hand hoe) is well understood. The crop will usually do well without artificial irrigation, but water should be given if needed. Pulling, curing and storing are important operations. When the tops begin to die the time has come to take the onions out of the soil, dry or ripen them, and house them for safe keeping.

CROPS AND MARKETS. John S. Crosby, of Arlington, Massachusetts, in 1895 sold 1275 bushels of onions from 1 1-6 acres of land. He grew them directly from the seed, using six lbs. of seed to the acre. The fertilizers were stable manure and wood ashes. The price that year, at that place, was fifty to sixty cents per bushel in the field.

Scullions in the Philadelphia market in early spring are worth from \$1.50 to \$2 per 100 bunches, wholesale. They retail at from three to five cents a bunch.

Onions at Philadelphia are often tied on straw, or "roped," and sold in that condition. It is a neat way of sending them to market, but adds somewhat to their cost to the consumer.

CHAPTER XVI.

SWEET CORN.



THE EARLIEST
CORN.

Sweet corn has a distinct place in every family truck patch, and is of the highest value as a money crop with the farm gardener. The market gardener, whose acres are few, cannot always afford to give it the space demanded for its growth. Farmers near good markets can always do well with sweet corn.

VARIETIES. Mr. Landreth divides the Indian corn group into six classes—Pop, Flint, Dent, Soft, Sweet, Pod or Husk.

The sweet or sugar corns may be considered under four heads—extra early, early, medium and late. These varieties are all suited to the latitude and altitude of Philadelphia. In mountainous regions, where the summer is shorter, the early or quick-maturing sorts must be grown. Corn demands hot weather.

SEEDING. Any good soil, especially sod, will produce corn. Compost or fertilizer, either broadcast or in the hill, will aid in getting good results. From eight to ten quarts of seed is the amount recommended per acre. In smaller plantings one quart of seed is enough for two hundred hills, allowing for waste and replanting.

The small, early corns require sixty days for reaching maturity. They grow but about three or four feet in height, and the hills may be as close as two and one-half feet by eighteen inches. The intermediate varieties should be planted in hills about three feet apart each way. The tall, late corns, which are nearly as large as the Indian types,

should be set in hills four feet apart each way. The late sorts require eighty-five to ninety days for reaching maturity.

May 10th is the recognized date for planting Indian corn in southeastern Pennsylvania; and the sweet corns, being even less hardy, should be planted later rather than earlier. Nevertheless, we find impatient gardeners planting in April every year, and often with success. It is worth the risk, because failure merely necessitates replanting, while success means a place in the high-priced early markets.

It is customary to plant four or five grains of corn in a hill, and to thin out to three stalks. Sweet corn is often sowed in rows, three or four feet apart, and the stalks allowed to stand six inches apart in the row. The time of planting is never before the latter part of April, after which other plantings should be made, so as to keep up a regular succession. The last planting of the medium sorts should not be later than July 4th, though the early kinds may be put in a little later, as they will mature before being caught by the frost. There are seldom any frosts at Philadelphia previous to October 1st.

The extra early and second early kinds of corn have some real merit, and generally command good market prices; but they are all inferior in sweetness to the later kinds.

Dreer's First of All and White Cob Cory fairly represent the extra early types; Crosby's Early and Stabler's Early the second early types; Roslyn Hybrid and Stowell's Evergreen the medium or general crop types; and Country Gentleman and Mammoth Sugar the late types.

The sweetest corns of all are the Little Gem and the Black Mexican. The former is sometimes called Shoe Peg or Ne Plus Ultra. The latter, as its name implies, is black; though, if pulled while very young, it is white. Country Gentleman is merely an enlarged type of Shoe Peg. These especially sweet corns, though of the highest domestic excellence, do not sell in the open market, as they do not make a

good showing. For choice retail trade or home use they are unrivalled. They are late, requiring eighty days to mature.

PLANTING FOR A SUCCESSION. The following plan may be suggested as sure to produce an unbroken succession of ears for table or market, weather permitting :

PLANT—

May	1—First of All	(60 days)	to mature	July 1.
May	5—First of All	(60 days)	" "	July 4.
May	10—First of All	(60 days)	" "	July 10.
May	10—Crosby's Early	(70 days)	" "	July 20.
May	10—Stabler's Early	(70 days)	" "	July 20.
May	10—Stowell's Evergreen	(80 days)	" "	July 30.
May	20—Stowell's Evergreen	(80 days)	" "	August 10.
May	30—Stowell's Evergreen	(80 days)	" "	August 20.
June	10—Stowell's Evergreen	(80 days)	" "	August 30.
June	20—Stowell's Evergreen	(80 days)	" "	September 10.
June	30—Stowell's Evergreen	(80 days)	" "	September 20.
July	4—Stowell's Evergreen	(80 days)	" "	September 25.
July	10—Crosby's Early	(70 days)	" "	September 20.
July	20—Crosby's Early	(70 days)	" "	September 30.

The only advantage of the second-early sorts in late planting is to make use of ground not available by July 1st, as the Crosby plantings of July 10th and 20th mature with the Evergreen plantings of June 30th and July 4th, or nearly so. It is often difficult to get corn started in the dry weather of July.



WHEELBARROW, FORCE PUMP OR HAND SPRAYER, WATERING POT.

CHAPTER XVII.

STRAWBERRY CULTURE.

The strawberry belongs in every garden, however small, and hence finds a place in this little book on vegetables. It is everybody's fruit—the best, the most beautiful, the most popular that grows in this latitude. May and June are the months of the strawberry, but it can also be fruited in the fall. The picking season here is from May 25th to July 5th, the main crop extending from June 1st to June 20th. The autumn production of strawberries may perhaps be developed as a paying industry hereafter, as some success in that line has already been achieved.

LAYER OR POTTED PLANTS. It is desirable to set out new strawberry beds in the earliest spring, while the weather is cool and the soil moist. The strawberry is perfectly hardy, and young plants can be obtained from an old bed as soon as the frost is out of the ground. The plants thus obtained are called "layer plants," as they are the result of runners which have taken root naturally. (A layer is usually made by bending a shoot or twig down and burying a portion of it in the soil, with the extremity exposed to the air. The buried portion will quickly strike root. Strawberry plants need no assistance, as their layers are self-rooting.)

Potted strawberry plants are used in midsummer or autumn, when the dryer condition of the soil makes transplanting more difficult. Layer plants set in April and potted plants set in July or August will both produce fruit the following season. For spring the layer plants are best, while for midsummer or autumn the potted plants are altogether preferable.

SETTING AND CULTURE. In setting out a strawberry bed the size of the place will determine the distance between rows. In large plantations the rows should be four feet apart, with plants eighteen inches apart in the rows. In small gardens the rows should be two feet apart, with plants fifteen inches apart in the rows. In the latter case the runners must be cut off, and the plants kept in hills; except that a few runners may be left for the purpose of setting out a new bed.

The four-foot system, with runners allowed to grow, is called the matted-row plan; the other is called the hill system. Market gardeners usually practice the matted-row system, as the hill system is far more laborious.

VARIETIES. Among the varieties most largely grown near Philadelphia at this time are Bubach, Brandywine, Bederwood, Gandy, Haverland, Parker Earle, Saunders, Sharpless and Woolverton.

Edwin Satterthwaite, Jenkintown, the largest grower near Philadelphia, on the Pennsylvania side of the Delaware river, uses none except perfect-flowering sorts. His favorites are Enhance, Gandy, Woolverton and Mt. Vernon.

B. F. Osler, Pensauken, New Jersey, ranks Saunders first; then Woolverton, Mary, Barton's Eclipse, Eureka, Enhance. He cannot grow Gandy—which is Mr. Satterthwaite's most profitable berry. This shows that different soils demand different berries. Mr. Osler discards for market purposes any berry whose bearing season does not cover three weeks.

Edward T. Ingram, West Chester, Pa., the originator of Brandywine, says his best early berry is Rio; best medium, Marshall; best medium and late, Brandywine.

In setting out strawberry beds it must not be forgotten that many kinds bear imperfect or pistillate blossoms. Among pistillates are some of the heaviest croppers, such as Bubach, Haverland and Crescent. Perfect-flowering kinds (of the same date of blossoming) must be set near them.

AGE OF BEDS. It is not material whether beds be allowed to bear one year or two. The common practice of market growers is to plow immediately after the first crop, and use the ground during the remainder of the season for something else.

Some growers cultivate the alleys immediately after the berries are off, and use the same beds a second season, with good results. This plan is quite feasible where there are not too many weeds.

Another practice is to run a sharp-toothed implement, like a potato cultivator, through the centre of the row. This destroys all the old plants, but leaves the young plants on both edges. The best strawberries are always where the plants have the most sunshine.

Edwin Satterthwaite has strawberry rows which have borne without interruption for a dozen years. The beds are absolutely clear of weeds. After picking the strawberries the plow is brought into use, and the rows are nearly destroyed, but narrow lines of plants are left standing for the production of new runners, which give the crop of the succeeding year. This plan is adapted only to high culture and skillful management.

FERTILIZERS. Well-rotted horse manure is the best stimulant for a strawberry bed. Crimson clover will just as well supply the necessary nitrogen. Wood ashes contains the potash demanded by the crop. A small amount of ground bone can be advantageously used. Nitrate of soda is often employed, in small quantities, as a top-dressing.

It is not advisable to set out a strawberry bed on sod land, on account of white grubs.

The irrigation of strawberry beds at the critical time in May when the fruit is setting is a matter that has had thought from every practical grower. A temporary drouth may ruin an otherwise successful and profitable crop. John Repp's plan, elsewhere described, is worthy of consideration.

WINTER PROTECTION. Strawberry beds need but little winter protection, yet this matter must not be wholly overlooked. There is perhaps more need of winter covering on sunny slopes than on northern exposures, as the changes of temperature are more sudden and disastrous in the former situations. A light covering of straw or manure is all that is required. The object is not to prevent freezing, for that does no harm. Alternate freezing and thawing, on the contrary, heaves the plants out of the ground and works injury to the bed.

Mr. Satterthwaite uses liberal quantities of horse manure from the city stables to cover his strawberry beds in winter.

MARKETING. The strawberry is so perishable in its nature that the home producer will never be driven out of the market by the distant shipper. The fresh article will always be in the best demand.

Mr. Ingram sorts all his berries before sending them to market, and commands a large and choice retail patronage. The work is done in the shade, immediately after picking, and is not expensive.

Berry-picking costs from one to one and one-half cents per box. The sorting costs from one-fourth to one-half cent per box. The box itself costs from one-half to one cent. The first item is unavoidable. The second item is fully warranted by the better price received. The third item is low enough to dictate the destruction of the box after using it a few days, as an old or soiled box will invariably rob the berries of one to three cents per box in their selling price.

The pleased custom willingly pays for the new, clean box.

PART III.

CHAPTER XVIII.

BUTTERFLY BLOSSOMS—PEAS AND BEANS.

The next decade of American horticulture will assuredly see a radical change in the system of manuring the soil. In places where stable manure can be obtained easily and cheaply this change will be slow, but in gardens of large size remote from towns the pulses will be called upon to help supply the needed fertilizers.

Crimson clover is the most available pulse now in use, but the vetches will probably come into favor.

All the pulses have butterfly-shaped blossoms, and are thus easily recognized. They take nitrogen from the air, and by the decay of their tops and roots yield it to the soil. Their most characteristic features are the little lumps on the roots, called "bacteroid tubercles" by agricultural chemists. No other domestic plants (so far as now known) share this wonderful ability. The clovers, the peas and the beans possess it in high degree. Vetches are peas in fact. Peas and beans are the only common pulses in the vegetable garden, and the title of "butterfly blossoms" is given to this chapter to direct attention to the fact that they possess manure-collecting value as well as crop-yielding value.

For their successful cultivation peas and beans demand only good average soil, though they will respond to and reward high culture.

These crops have a distinct place in every family garden and in every farm garden, but on account of the space which they demand they are often crowded out of small market gardens. Fresh peas and beans are always in brisk demand in the summer markets, and are seldom over-produced.

PEAS.

(1 pt. to 100 feet of drill; $1\frac{1}{2}$ bu. to acre.)

Peas will do well in any good soil. The seed may be planted as soon as the ground can be worked in the spring—even in March. The smooth sorts should be sown first. The wrinkled sorts, which are larger and sweeter, are rather less hardy, and should be sown later, say beginning April 1. Wrinkled peas sometimes rot in the ground during cold, wet weather, but the smooth sorts are almost hardy.

Grouped roughly, the extra early peas are smooth, while the medium and late peas are wrinkled.

Three agricultural groups are recognized, typified in the common garden pea (*Pisum sativum*), the edible-podded pea (*Pisum macrocarpon*), and the field pea (*Pisum arvense*). The garden pea is divided into a hundred or more varieties, depending on earliness, size, color and shape of seed and pod, and other points.

In field culture the rows are from two to four feet apart. All the medium peas can be grown in single rows two feet apart; and it is excellent practice to grow them thus, and turn the vines under for manure immediately after the second picking. The tall late varieties must have more room, especially if sticks are to be used; though market gardeners avoid sticks or brush, on account of the expense.

In small gardens peas may be planted in double rows eight or ten inches apart, with alleys between for the pickers; though the field plan is quite applicable to the garden, using single rows and reducing the distance between rows to twenty inches.

In dropping pea seeds, either by hand or with a drill, the distance between seeds should be about one inch, and the depth below the surface one inch in cool weather and two inches in warm weather; and soil should be drawn toward the roots from both sides during the cultivation, to keep the roots cool.

The dwarf peas mature in from fifty to sixty-five days from date of sowing, the medium sorts in from sixty to seventy days, and the tall-growing late sorts in from seventy to eighty days.

The planting season for peas may be said to extend from the last of March until the last of June; then a summer interval; then an August sowing for a late crop, the August planting to consist of the quick-maturing varieties.

Pea picking, if hired, costs from ten to fifteen cents a half bushel basket, and the average selling price is somewhere about fifteen cents a half peck. Early peas usually retail at a higher price.

To provide for a succession of peas in a family garden the following is suggested. The varieties may be changed to suit locations or preferences of growers:

PLANT—

April 1—Eureka Extra Early (60 days), to mature	June 1.
April 10—Eureka Extra Early (60 days), “ “	June 10.
April 20—Eureka Extra Early (60 days), “ “	June 20.
April 20—Abundance, (70 days), “ “	June 30
April 20—Champion of England (80 days), “ “	July 10.

The market gardener will of course put in repeated plantings of Abundance, Advancer, Horsford's, Heroine, or other medium pea; and the private gardener can do the same, if desired.

Martin Geary, gardener to Frederick W. Morris, “Dundale,” Villa Nova, Pa., plants four long rows of peas (375 ft.) every week from early spring until July 10. He anticipates work by beginning with Eureka peas in the open border, during March, protecting the ground “with a little shake of straw.” As soon as the open garden is fit to work he sows Eureka in rows $2\frac{1}{2}$ feet apart. A week later he sows the same, and two weeks later again sows Eureka.

On the latter date (which approximates April 20, as above), he sows Abundance, and repeats this twice. With the third planting of Abundance he uses Yorkshire Hero,

and continues with it until July 10. On the 20th and 27th of August he again sows Eureka. This is practically the same as above suggested, but with certain variations dictated by experience. Mr. Geary is compelled to furnish large quantities of peas, in unbroken succession, and works on the plan above outlined.

A SUGGESTION ABOUT GOOD VARIETIES.	Early—	(50 to 65 days): Eureka Extra Early, Extra Early Pioneer, American Wonder, Alaska.
	Medium—	(60 to 70 days): Advancer, Horsford, Abundance, Heroine, Yorkshire Hero.
	Late—	(70 to 80 days): Champion of England, Long Island Mammoth, Everbear- ing, Large White Marrowfat.
	Edible Podded—Dwarf White Sugar, Tall White Sugar.	

BEANS.

(1 qt. to 100 feet of drill; pole beans, 3 to each pole).

In treating of beans the subject may be introduced in the same manner that the subject of peas is brought to an end—with suggestions about varieties. The general culture is quite similar, but beans are not quite as hardy as peas. They are, however, planted under the same general conditions. The blossom shapes are the same in plan, and they are of close botanical kin with the peas. The following suggestions will serve to introduce the various groups and classes of this most important vegetable:

Dwarf Lima:	Dreer's Bush, Burpee's, Henderson's.
Green-podded bush:	Improved Red Valentine, Extra Early Refugee, Early Mohawk, White Val- entine.
Yellow-podded or wax:	Davis Wax, Valentine Wax, Early Refugee Wax, Improved Rust-proof Golden Wax.
Pole Lima:	Dreer's Improved, Early Jersey, Sie- bert's Early, King of the Garden.
Pole or Running: (wax)	Dreer's Golden Cluster, Golden Cham- pion.
Pole or Running: (green pod)	Horticultural or Speckled Cranberry, White Dutch Case Knife, White Runner.

The varieties of beans are legion. Of the so-called "dwarf" limas there are three distinct types—the fat or thick bean, the large flat bean of ordinary shape, and the small or sieva bean. Dreer's Bush is of the first, Burpee's of the second, and Henderson's of the third type.

The green-podded and yellow-podded beans, or "snap" beans, are very commonly grown in the country adjacent to Philadelphia. They mature in from thirty to forty days from the time of sowing, and may be used either in the fresh state, with the edible pods, or may be ripened and thrashed.

The true pole limas are still in the highest favor, as their habit of growth favors a long, continuous crop. It is both troublesome and expensive to provide poles, but it is believed that results justify their continued use.

The running pole beans are more or less grown, but those just mentioned are to be found in greatest quantities in the Philadelphia wholesale and retail markets.

Lima beans are sold both shelled and unshelled.

When unshelled the common retail price is about fifteen cents a half peck. The price is higher in the early part of the bearing season, and to hasten the crop the seed beans are sometimes started on inverted bits of sod, under glass, and the young plants carried into the open air about May 20, when danger of frost is over. The sod is buried in the hill, at the foot of the pole, and the bean roots are not in any way disturbed by the transfer.

Beans are frequently forced in greenhouses, as mentioned in **VEGETABLES UNDER GLASS**.

The bean crop is in favor with market men, as it yields a good deal of ready money. The snap-short kinds are ready for sale before peas are ripe, and the limas bear through mid-summer, when peas do not compete with them.



Implement
for setting
bean poles,
made of 1-
in. galvan-
ized pipe.

Lima beans should never be shelled long before marketing, as the process robs them of their flavor, permitting them to become dry.

The bush varieties may be planted in late summer for autumn cropping, but must have moisture at the start to make the work profitable.

All the bush beans are liable to rust or spot, in what we term bad weather, or under conditions of weakness of growth. The best remedy is good soil, proper cultivation and a removal from infected localities.

Martin Geary, Villa Nova, started King of the Garden lima beans on inverted sods under a sash about May 10, 1896. He set poles $4 \times 4\frac{1}{2}$ feet apart, and put two young bean plants at each pole. He picked beans July 18th. The fertilizing material used was well-rotted cow manure, spread broadcast, and also applied (a shovelful) around each pole.



TYPES OF HOES.

CHAPTER XIX.

THE CRUCIFERS.

Broccoli,
Brussels Sprouts,
Cabbage,
Cauliflower,
Collards,

Cress (Peppergrass),
Horseradish,
Kohl-rabi,
Kale (Borecole),
Mustard,

Radish,
Ruta Baga,
Sea Kale,
Turnip,
Watercress.



The Cruciferæ or Mustards all have flowers of remarkably similar form. The blossoms are cross-shaped. The Latin word *crux* means a cross; cruciferæ is from *crux*. In no other botanic family is the flower shape more uniform. A turnip blossom, for instance, is the same in form as that of cabbage, radish, water cress, peppergrass or mustard. There is a difference in color, in many instances; but as a whole the cross-shaped flowers are nearly identical in size and style, and botanists therefore depend for classification upon the seed pods.

In the case of the crucifers it is possible to lay down definite lines, and to call them hardy. They all distinctly belong in that botanic class which demands a temperature ranging from the freezing point up to say 65° . They will live in lower and higher temperatures, but these plants grow with greatest strength and vigor in what we term cool weather.

The temperature of 65° is held by some expert gardeners to mark the line between the cool-weather plants and the tender or sub-tropical plants. The former thrive with 65° as a maximum temperature; preferably not above that point, even at midday. The latter thrive with 65° as a minimum temperature; preferably not below that point, even at midnight. As applied to open-air operations this fact favors spring and fall planting; while applied to under-glass

methods it has the highest significance. It would be a mistake, for instance, to attempt to grow cauliflowers and cucumbers in winter in the same greenhouse.

CABBAGE.

Cabbage is the most important commercial member of this group of plants. It is in demand during the entire year, and ranks in value next to the potato as a kitchen vegetable.

Yet while it can be found on the stalls at any time of year there are market gardeners who grow only the early or small varieties ; while on some large truck farms cabbage is grown only in the fall, and none but the large sorts are planted.

VARIETIES. It is not the purpose of this book to give full lists of varieties of vegetables, but only to mention a few reliable types in connection with cultural directions.

The early cabbages have small, compact heads, mostly pointed, while the late kinds have large heads, which are usually flat.

Standard early varieties at Philadelphia include Early Jersey Wakefield, Etampes and Early Winnigstadt ; second-early varieties, Large Jersey Wakefield (Charleston), Improved Early Summer, Dreer's Early Drumhead ; late varieties, Large Late Drumhead, Dreer's Selected Late Flat Dutch, Louisville Drumhead.

These strains are for the most part old and well known ; and there seems to be no better way to improve types than through the careful selection of seeds from sorts of recognized and long-established merit.

The Savoy cabbages have curled or wrinkled leaves, and are much esteemed, as they are regarded as being especially sweet. The Savoy type appears in both green and purple cabbages ; and the word " Savoy " is also applied to a form of spinach having wrinkled leaves ; also to kale.

CULTURE. Cabbage seed is frequently sowed in September, though to a less extent than formerly. A note book

of 1896 records the fact that a certain Long Island gardener was filling an extensive frame with young cabbage plants on the 29th of October. The seed had no doubt been sowed about September 10 or 15.

At Philadelphia the Early Jersey Wakefield is in especial favor for this purpose ; though the Large Jersey Wakefield is also used. The latter is only about a week later in reaching maturity.

Thomas Brooks, Jr., Richmond street, Philadelphia, an extensive market gardener, with 1500 sashes, sows Large Wakefield cabbage seed broadcast September 10 or 12, and transplants to boxes (frames) in November, when the plants are five inches high. They are freely aired during the winter, and set in the open ground in March, in rows twenty-seven inches apart, and the plants sixteen or eighteen inches apart in the rows. The cabbage is ready for market about the 8th or 10th of June. It requires thirty-five to forty heads to fill a barrel.

For second-early cabbage Mr. Brooks sows seed in spring, as these sorts when wintered over show a decided disposition to "shoot," or go to seed. The seed is sown in February, without heat, and the young plants are ready for the open ground in April. Mr. Brooks thinks an autumn-sown cabbage makes a harder head ; but it is too liable to go to seed. The second-early cabbages are set in rows twenty-seven inches apart, with eighteen to twenty inches between the plants.

Mr. Brooks grows no late cabbage except Savoy, the seed of which is sown May 15 to 20, and the plants set in the open field in July. Late cabbage demands more room—say rows three feet apart, and the plants two feet apart in the rows.

The date quoted by Mr. Brooks (May 15 to 20) is the common date for sowing seed of late cabbage ; though the work can be done a full month later if especial care be given to the young plants.

FERTILIZING. Cabbage is a rank feeder and demands heavy manuring and high culture. Mr. Brooks uses in his gardens large quantities of city manure, night soil, cow manure, pig manure, and street dirt, either separately or composted; and often 500 lbs. of complete fertilizer per acre in addition to natural manures. He says that well-rotted stable manure gives the best results with cabbage in dry seasons; that night soil, while more stimulating, is apt to cause the crop to "burn" during periods of drouth.

The cabbage crop is a profitable one if the grower is near enough to watch the market, but the distant shipper is liable to have his consignment thrown upon an over-stocked market, with consequent low prices. Wholesale prices vary all the way from \$6 down to \$1 per 100 heads, the latter quotation of course tending to shut off the supply.

STORING. Cabbages for seed purposes are stored with their roots down and heads up during the winter season. For food or market purposes the heads are placed downward and the roots upward. In both cases the cabbages are completely covered with soil, and some provision is made for drainage—at least to see that no water stands on the surface of the ground where the cabbages are buried. Sometimes a wedge-shaped mound is made above the upturned cabbages; or the heads may be laid in a long row, six or eight abreast, roots uppermost, and merely protected by a flat blanket of soil.

Cabbage heads, with or without the roots, may be made into a compact conical heap or ridge and covered with straw, and permitted to freeze solid. They will endure the cold; but they must not be subjected to sudden thawing, or they will rot.

DISEASES AND ENEMIES. For remedies for flea beetle, cabbage worm, club root, maggot, etc., see elsewhere, as indicated by the index. The best remedy for most of the

ailments of the cabbage is new soil. A healthy cabbage plant in fresh soil is almost certain to produce a head, despite all enemies, provided the culture is good.

SPRING SEEDING. It is entirely feasible to start the earliest sorts of cabbage in hotbeds in spring, and to produce heads almost or quite as early as with wintered plants. A good hotbed made ready in early February, and seeded on the 15th, will yield plants fit for transplanting in March and for the open ground early in April. If these plants are properly aired and hardened they will make quick growth in the open ground, and will head in June.

OTHER CABBAGES. The "cabbages" may be said to include Broccoli, Brussels Sprouts, Cauliflower, Collards, Kohl-rabi, Kale or Borecole, and Sea Kale. All demand rich soil and high culture.

CAULIFLOWER AND BROCCOLI.

These two vegetables are nearly identical; and when young both closely resemble cabbage plants of the same age. Broccoli is largely grown in England, but Cauliflower is preferred in America, and is more largely grown here. The plants have rather different seed-producing abilities, as shown in the fact that Broccoli seed can be bought for 50 cents per ounce, while Cauliflower seed costs from that figure up to \$5 per ounce. Broccoli can be grown successfully in some localities where Cauliflower does not seem to thrive.

ON LONG ISLAND. The frontispiece is from a photograph taken with a Dreer camera on the eastern end of Long Island, on the 28th of October, 1896. The climate there, in the autumn especially, is cool and moist, and the soil is perfectly adapted to Cauliflower growing. The vegetable has become a staple crop of the neighborhood, as may be inferred from the fact that 4000 barrels per day have been shipped from a limited area of country adjacent to Mattituck. In

addition to these heavy shipments by rail enormous quantities of Cauliflower go to the local pickle factories, which paid $1\frac{1}{4}$ cents per pound for "flowers" in the fall of 1896. Of course when New York prices are good the farmers do not have to carry their produce to the factories. The average Cauliflower weighs perhaps 6 lbs., though specimens of 8 or 10 lbs. are not rare, and a 13-lb. specimen is on record at Mattituck.

The heads shown in the engraving were taken from the wagon that appears in the picture. The topmost head is Snowball; the others are Dwarf Erfurt. Cauliflowers are not grown early in the season on the east end of Long Island, which is nearly one hundred miles from New York; but the autumn crop is enormous, and the heads are hauled along the roads in hay wagons in quantities. The Erfurt types have driven the large Algiers types almost wholly out of favor in that neighborhood.

Cauliflower seed is sown at Mattituck from the 10th of May to the 15th of June. It requires about six weeks to get the plants ready for the field. Half a ton of fish scrap, half a ton of complete fertilizer, and 500 lbs. of kainit constitute the top-dressing for an acre of land. The kainit tends to discourage the cut worms, and with the fish scrap is broadcasted. The fertilizer is used in the rows. The plants are set about three feet apart each way, and the yield per acre is expected to be from four to five tons. Cutting begins about September 1 and continues until December 1. Freezing weather does no damage until the mercury gets below 20°. After December 1 the Cauliflowers are not safe in the fields.

IN PENNSYLVANIA. At and near Philadelphia this vegetable is grown in three ways: As a winter crop, under glass; as a spring crop, with plants started on heat; and as an autumn crop, in the way followed by the Long Island growers.

The method of forcing Cauliflower is described in *VEGETABLES UNDER GLASS*, a companion volume to the present handbook. The Long Island autumn method is successful in Pennsylvania, provided the soil is rich and provision made for a water supply—for Cauliflower is impatient of any check during its period of growth.

For early Cauliflower the seed may be sown February 15, in a hotbed, as recommended for cabbage. The best types are Snow Storm, Dwarf Erfurt and Snowball. The young plants must be transplanted into cool frames, well aired every day, and set in the open ground in April. If well started, set in good soil, and thoroughly cultivated they will make a quick growth, and will head in June.

It is good practice, both under glass and in the open air, to use a wooden pin or string to hold the leaves together over the young head, to preserve its ivory whiteness.

The Long Island growers are compelled to remove every vestige of leaf when they carry their Cauliflowers to the pickle factories; but for shipment to market the leaves are cut off even, and a piece of white paper is spread so as to prevent the "flower" from injury by rubbing. The Cauliflowers thus prepared are carefully packed in ventilated barrels for shipment. Good Cauliflower is always in demand

in the Philadelphia markets, and usually commands fair prices, both winter and summer.



BROCCOLI.

BROCCOLI. Broccoli is a variety of Cauliflower, as already mentioned. Its general cultural requirements are the same as of Cauliflower, but it is more hardy. John Gaynor, gardener to Mrs. William H. Kemble, Glenside, Pa., recommends setting young Broccoli plants in firm ground,

manured the previous season ; ground hoed and raked, but not dug for the Broccoli. The object is to discourage rank growth at first, and to produce dwarf, stocky plants. Broccoli can be kept over winter under a thatch of corn stalks. Mr. Gaynor prefers the White Cape variety. Light ground must be avoided. The seed is sown the same time as winter cabbage, say May 10 to 20.

BRUSSELS SPROUTS.



BRUSSELS SPROUTS

This vegetable is a cabbage in fact, but produces many heads instead of only one. In the axil of each stem leaf a little "head" the size of a walnut makes its appearance, and these heads or "sprouts" are of excellent flavor. They are sold by measure in the autumn and winter markets.

John Gaynor, heretofore quoted, sows seeds of Brussels Sprouts in April, in the open air, in rows where the plants are to remain. They may be transplanted when small, while in the rough or second leaf; but transplanting tends to make them too "leggy;" that is, with stems that are too long. The rows should be $2\frac{1}{2}$ feet apart and the plants 18 inches apart in the rows, in deep, mellow ground highly manured the previous year, but not freshly manured nor plowed just prior to planting the "sprouts." Top growth is to be discouraged. A stocky, well-set plant is desirable; a plant not over 2 or $2\frac{1}{2}$ feet in height. If set in soft ground and treated like cabbage the stem growth is excessive. Firm or even hard ground is preferable, if deep and in good heart. The plants may be hoed after setting.

Mr. Gaynor also sows the seed of Brussels Sprouts (Select Matchless) as late as the end of June or in early July, after peas, without plowing the ground. Light, sandy soils are to be avoided. "Sprouts" can be safely wintered under a good protection of corn stalks, made into a thatch.

For cooking Brussels sprouts Mr. Gaynor recommends that they be gathered in the early forenoon, the outside leaves removed, and the sprouts soaked in salt water for several hours, and then boiled. No strong odor is given off. This is in reality among the best and most delicious of vegetables.

COLLARDS.



A COLLARD.

The Collard is a non-heading variety of cabbage grown mostly in the Southern states. Some Collards grow to a height of five feet. The plants are often called "cabbage greens." When grown in the North "Collards" are practically the same as early cabbages grown in close rows (a foot apart) and cut for use when six inches to a foot high. The Creole or Southern Collard is

quite extensively grown in the South, where the climate is too warm for the true cabbages.

CRESS (PEPPERGRASS) AND WATER CRESS.

The Cresses are much used for salad-making. They are especially relished in spring time, on account of their fresh, pungent taste. Peppergrass and Upland Cress are less used in America than Water Cress. The latter is in daily demand, in large amounts, all through the year. In the large Eastern cities Water Cress is an essential relish in every restaurant.

Extra Curled Cress or Peppergrass is the best sort for

dry soils. It must be sowed thickly in spring, in shallow rows a foot apart. Repeated sowings are necessary, as it soon runs to seed.



CRESS OR PEPPERGRASS.

Upland Cress is a perennial plant grown in the open ground and treated like spinach. It will crop for at least two years. In flavor it is much like Water Cress, which it resembles.

Water Cress is easily grown in any running brook or spring head. It requires shallow water and a sandy bottom. It can be grown in the soil of the garden or in the bed of a forcing house. See *VEGETABLES UNDER GLASS*. It is grown from seeds (Erfurt variety), or from stem or root cuttings. It is used in prodigious quantities in the large cities.

HORSERADISH.

Horseradish is grown in large quantities by the Philadelphia market gardeners. They set the young roots or sets in rows in the open garden or field, and grow it by the acre, in rotation with other crops. The sets are made from the small side shoots of the previous year, and are the size of a lead pencil, and about eight or ten inches long. In making the sets the lower end should be cut with a bevel, in order that all the roots may be planted right side up. The length of the set determines the length of the marketable root. If sets are planted between rows of early cabbage they can have the exclusive use of the land after the cabbage is marketed, and will be ready for market in the fall or following spring. Good land and high culture are advisable. The roots must be taken out of the land as thoroughly as possible, as remain-

ing portions will grow. Horseradish retails in winter at from three to ten cents per root. The root is made ready for market by carefully washing it and trimming off the leaves and all small or feeding roots.

KOHL-RABI.

Kohl-rabi is turnip-rooted cabbage—just as celeriac is turnip-rooted celery. We also have turnip-rooted parsley and turnip-rooted chervil. This peculiar thickening of the stem is the result of selection and long cultivation.



KOHL-RABI, OR TURNIP-ROOTED CABBAGE.

This vegetable is grown to a considerable extent at Philadelphia, both in the spring and fall. The seed is some times sown in frames in February, without heat, and the plants set out in April, in rows a foot apart and ten inches apart in the rows. It is rather difficult to transplant, except in cool weather. The seed may be sown in the open ground in June, and the plants thinned to the distances already mentioned. The Kohl-rabi will suffer if the soil is light and sandy, but in rich loam it will make a crop in

autumn. It is tied up in bunches, with three or more plants to the bunch, for marketing. Earliest Erfurt is white; Early Purple Vienna a bluish-purple variety.

KALE OR BORECOLE.

Kale is grown in enormous quantities near the large Northern cities, and is always to be seen in the winter markets. It is merely a species of cabbage which does not head. It is ornamental in appearance, as the leaves are curled and wrinkled and often grow in a graceful manner. It is not customary to look for grace and beauty in a cabbage patch, but a luxuriant field of frost-covered kale in November bears

a close resemblance to a mass of ostrich plumes, and the kale leaf is as handsome as the ostrich feather.

Kale resembles the other cabbages in its two main colors, being both green and purple; and the patches of this vegetable in the market gardens adjacent to the large cities add brilliance to the autumn landscape. Some strains are perfectly hardy, and remain out all winter, quite unprotected.



KALE.

of vigorous growth. Dwarf Green Curled German is another good kind. The list of varieties is a long one, including several which are locally and incorrectly called "sprouts." Kale has grown widely in favor, possibly aided by Peter Henderson's statement, made years ago, that of all the cabbage tribe it is "the most tender and delicate." It is grown in private gardens as well as in market gardens at Philadelphia.

For autumn cropping the seed should be sown in May or June, the same as late cabbage; for spring cropping the seed should be sowed in September. Imperial Long Standing is a reliable green type,

MUSTARD.



MUSTARD.

Mustard is used as a salad. The leaves are cut and chopped up with Cress. It can be had all through the year, if desired. Sow in rows six inches or a foot apart, the seeds being scattered quite thickly in the row. Repeat the sowings

to make a succession. If wanted in winter protect with sashes or sow seed in a hotbed. If the seed is wanted sow in April, in rows a foot apart, with three inches from plant to plant. White London is a favorite variety.

RADISH.

The Radish is perhaps grown with greatest profit under glass, during the winter season, and large greenhouses are wholly devoted to its production. Still, it is also grown in enormous quantities in the spring months, and to some extent also in the autumn. To be tender and succulent the Radish must be grown quickly; and quick growth depends upon high manure, sufficient moisture, cool weather and good culture. It seems odd to class the Radish with the cabbage, but it has a close botanical relationship thereto, as shown by its flowers and seed pods.

Radishes may be grown alone or in alternate rows with beets, lettuce, onions or other crop. They mature in five or six weeks from the seed; that is, they are then large enough for market, and should not be allowed to remain longer in the ground, for they gain nothing in quality even though increasing somewhat in size. If the radishes are pulled at the proper time the ground is made ready for a new crop, or for the development of the crop occupying the alternate rows.

In frames radishes should be planted six inches apart; in the open air nine inches apart. Or they may be sowed between rows of beets, onions or lettuce set a foot apart, provided the small-top radishes be employed. For radishes in frames or greenhouses see *VEGETABLES UNDER GLASS*.

The Early Scarlet Turnip is a standard sort for open-air work at Philadelphia. Half-long Deep Scarlet is a good intermediate radish for the open garden. Philadelphia White Box (under several names) is one of the most satisfactory and profitable white turnip sorts.

For summer radishes there are several kinds, including

red, white and yellow. Beckerts' Chartier, Large Summer White and Large Yellow Summer are representatives of the class.

The winter radishes, which should be sown in July and August, make a vigorous autumn growth. They should be stored in sand when freezing weather comes, and placed in water (to freshen them) when wanted for use. Black Spanish, White Spanish and Scarlet China are types of winter radishes.

Radishes form one of the market gardener's quickest and most available money crops, and should be furnished whenever demanded, as their production is not difficult.

For radish maggot, which is a very serious injury to the root, new soil is the best known remedy. Early spring radishes will not be troubled much with insect enemies. Soot, wood ashes or air-slaked lime must be used with summer sowings, to protect the young leaves. Copious watering in summer, to stimulate rapid growth, is desirable.

RUTA BAGAS AND TURNIPS.

The Ruta Baga is one of the forms of Turnip; and the Turnip varieties are legion. As garden vegetables Turnips may be sown in the earliest spring, in rows a foot apart, with the plants thinned out to six or eight inches apart in the rows.

The main plantings of Turnip, however, will be in July and August, for a winter crop; as Turnips are in greatest demand in autumn. They are suited to the table and also to stock-feeding purposes.

The Red or Purple Top and the Early White Flat Dutch are standard sorts in this vicinity; though many varieties are grown. Snowball is a sweet, white novelty.

Of Ruta Bagas the Improved Purple Top and American Purple Top are widely used.

For field culture, though broadcasting is very common, the best results are obtained by sowing in drills 18 inches apart, and cultivating. This method permits the plants to be thinned out, and insures a larger yield of better roots.

Turnips and Ruta Bagas may be wintered in root cellars, or in conical or wedge-shaped heaps in the open field. The heaps are covered with a few inches of straw, and then with from six inches to a foot of soil, with a ventilator made of a piece of tile at the top. Provision is made for the removal of surface water. The roots freeze in these heaps, but will keep in good order until spring.

Retail market men can do quite well with a few Turnips and Ruta Bagas in the fall and winter ; and live stock finds a good food in these roots.

SEA KALE.

Sea Kale is a perennial ; a member of the cabbage family. It is grown for the blanched shoots which come up the second year, and in after years, and which are cooked like asparagus. The seeds are sown in spring, and the plants set out like cabbage. The first year the growth is slender. The second year the shoots are blanched by heaping up earth around the plant ; or a barrel may be inverted above the plant, and surrounded with fresh manure, to force the shoots.

John Ward, gardener to Mrs. John Bohlen, Chestnut Hill, near Philadelphia, sows Sea Kale where it is to permanently remain, on account of the trouble of transplanting it. It will last for years, if well established. Mr. Ward

takes up three-year-old roots, and "forces" them, just as rhubarb is forced, under greenhouse benches. To blanch the shoots in the open air he uses a barrel, as above recommended. The shoots must be made to grow in a dark place, in order to bleach them properly.



SEA KALE.

CHAPTER XX.

THE NIGHTSHADE GROUP.



There is a striking resemblance between the blossoms of the potato, the tomato, the egg plant and the pepper. They belong near together, botanically. They are all "nightshades." They are naturally tender, the potato being the most hardy one of the class.

THE POTATO.

The Potato is everybody's vegetable. It can be grown from seed, but the method requires several years, and the common way is by division of the tubers. The operation of potato cutting and planting is known to everybody who works the soil, yet to this day there are wide differences of opinion concerning details.

The common practice is to cut so as to leave one or two "eyes" in a piece, and plant in rows three feet apart, with the "seed" a foot apart in the rows. In good soil, well fertilized and well cultivated, a yield of 200 bushels per acre can be secured. The record has been pushed as high as 700 bushels per acre, but not on a commercial scale. The average yield is not above 200 bushels.

Some growers cut off and destroy the numerous "eyes" at the blossom end of the potato, and then cut the remainder into from two to six pieces, each piece having one or two strong "eyes." A widely advertised secret process, a few years ago (for which the buyer paid a dollar), consisted in cutting out and destroying all the "eyes" of a potato except one, the claim being made that this one shoot or sprout would get all the strength of the tuber, and would produce early and marvelous results. The method has not been much practised.

Clean seed potatoes, free from rot and scab, are needed for success. The plan of cutting is a secondary matter. The essentials are deep culture and good manuring. The market is often overstocked with potatoes, but potato growing will never cease to yield profits to those cultivators who grow the best tubers at the smallest cost.

It is generally admitted that any stock or strain of plant that is grown from cuttings, runners, or division of tubers or roots will eventually become weak, and that an occasional return to the seed is necessary. This is quite true with potatoes, and hence new varieties are constantly produced to supply the places of those which have lost a portion of their original vigor. It is seldom, however, that a new variety has sufficiently strong merit to attract the attention of the whole country.

The Blue Mercer potato, in high favor half a century ago, has not yet been forgotten by our older farmers; and it is surprising to note that this original stock, in a pure state, is still grown on a farm in Bucks county, Pennsylvania. The grower is Samuel Walker, Johnsville, and the pedigree of the potato extends backward in that neighborhood for fifty years. The fact is cited to show the lasting qualities of a really strong type.

Present-day favorites include Early Rose (on the market a quarter of a century), Standard, Early Ohio, Early Puritan, Beauty of Hebron, Burbank, Freeman, State of Maine, White Star, the Carman seedlings, and many others.

The destruction of potato "bugs" or beetles is easily accomplished by means of Paris green mixed with plaster or in water. The far more serious troubles, blight and rot, are not so easily mastered, but are now under control to a great extent.

SCAB AND ROT. The New Jersey Experiment Station has demonstrated that the substance known as flowers of sulphur, costing only one or two cents a pound, is the best

known preventive of scab and soil rot in both white and sweet potatoes. The wide observations and comparative tests made by Prof. Byron D. Halsted put sulphur at the head of the list, both in efficacy and economy. Sulphate of copper is effective, and so is corrosive sublimate. Stable manure increases both scab and rot. Lime increases scab and diminishes rot. Kainit, on the other hand, decreases scab but increases rot. Sulphur, in the form of "flowers of sulphur," scattered in the open row at the rate of 300 lbs. per acre, gives the best results. Sulphur in the New Jersey trials reduced scab and rot down to about 1 per cent., practically curing both evils.

EGG PLANT.

Egg Plants are best when started late, for they demand a high temperature for their growth and development. The seed is often sown in hotbeds in March, but it is better to defer the sowing until April. If sown in the open border the seed must not be trusted to the soil much before May 20th, when danger from frost is at an end.

Grown in good soil, and protected against potato beetles, the Egg Plant is ready to do its best work during the hottest months of midsummer, but demands a full supply of water to carry on its growth to best advantage.

The New England growers irrigate Egg Plants in the open field, and this is no doubt the most effectual way of securing a crop, for the occurrence of a drouth at the time the fruit is undergoing rapid development results in a disastrous check; and this probably accounts for the fact that the half-grown fruit is often attacked by a blight, causing it to drop from the stem.

Egg Plants should be grown quickly, and without any check or interruption. The fruit usually sells well in the markets, though there was an over-production in 1896, with consequent low prices. The fruit when sliced and properly

fried is highly nutritious and wholesome, and has a fine flavor. Like all vegetables, it is best when fresh. New York Improved Large Purple is a good variety.

The planting distance for Egg Plants may be quoted as three feet each way. This allows for cultivation.

Private gardeners sow the seed as early as March or even February, and pot the young plants, changing the pots as fast as the roots demand it. Time is thus gained, as the plants are large and stocky by the latter part of May.

PEPPERS.

The Peppers commonly grown are the large so-called sweet sorts and the little hot sorts. The former are both red and yellow; the latter mostly red. The former are much used for flavoring soups and meats and for pickling; the latter for sauces.

The sweet varieties include Large Bell or Bull Nose, Ruby King and Large Sweet Spanish. Golden Dawn is yellow. Long Red Cayenne is hot, as also are Small Chili, Red Japan Cluster and Red Cherry.

Peppers demand warm weather, but are rather less delicate than Egg Plants, and are easily grown. They may be set closer than Egg Plants—say in rows three feet apart, and the plants two feet apart in the rows.

The time of sowing the seed is similar to that of Tomato—say in March under glass or in May in the open ground. The smaller varieties are sold in great quantities in bunches of pot herbs in the city markets.

Private gardeners with glass frequently start Peppers in pots, using first the three-inch size and then the five-inch size, and having large plants ready for the open ground in May.

THE TOMATO.

A well-prepared hotbed made ready for the reception of Tomato seeds by the 15th of March will yield large, well-

grown plants in time for open-ground operations in May. In four or five weeks from date of seeding it will be necessary to transplant into more roomy and preferably cooler quarters, in order that the young plants may be made strong and stocky by the sun and air. If transferred from hotbeds to cold frames about the middle of April, and given a little protection besides the glass when the nights are especially cool, the sashes may be removed early in May, to be replaced only in case of frost, and the plants will be ready for the open ground by May 20. Such plants will produce fruit sometimes in July and always in August. Four feet apart each way in the open ground is a good planting distance. Tomato seed sown in the open ground in May will give plants that will yield fruit in September.



THE STONE TOMATO.

The Tomato crop belongs to the farm garden rather than to the market garden, on account of the area of ground occupied. The New Jersey truckers plant large fields with this vegetable, and supply the Philadelphia markets to a great extent. The Tomato of course has a place in every family garden ; and private gardeners frequently start the plants in pots, under glass, and have them ready to bear fruit in the open air in June.

The matter of stakes or trellises is purely one of convenience. In a ten-acre patch in New Jersey it would be wholly out of the question to use trellises, while in every small garden the trellis, stake or frame should be employed. In under-glass work the vines are always supported, and the extra work is warranted in all limited areas by the finer and more perfect fruit thus secured.

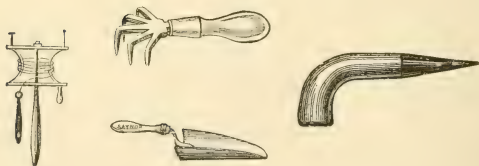
VARIETIES. The early Tomatoes are represented in the Atlantic Prize and Dwarf Champion—the latter being a distinct type. The main crop Tomatoes are represented in the Stone, Early Michigan, Acme, Selected Trophy, etc. The Pink Mikado or Turner's Hybrid is a late Tomato of rank growth but great excellence. The leading Tomatoes for forcing under glass are Lorillard and Mayflower. There are also on the market several large yellow types and a great number of smaller forms, varying in shape from globular to plum and pear, and in color from red to yellow. The latter are used mainly for pickling. They are highly ornamental but not commercially important.

BLIGHT. The Jersey tomato fields are sometimes swept by blight, as was the case with the early plantings in 1896. This disease is hard to manage. It results probably from an enfeebled condition of the plant, caused by unsuitable weather. The late plantings are less liable to attack. The temptation to be first in the market with home-grown products sometimes leads growers to run unwise risks in setting out their plants, or to set out plants not properly hardened. If the weather is good the experiment succeeds, but if the nights are cold there are sometimes disastrous failures. The best remedy is well-hardened plants, set out not too early. Weak Bordeaux mixture may be used with satisfactory results, as a preventive of both blight and rot. Flowers of sulphur is also to be recommended. (See Prof. Halsted's work with Potatoes). New soil is to be advised, whenever possible, in order to secure the crop benefits which come from a rotation; for rotation is a cure for certain diseases which result from partial exhaustion.

MARKETING. The best profits from Tomato growing, under present market conditions, will be found in the production of a choice article for near-by wholesale or local retail trade. Fresh, ripe Tomatoes are always in demand, and in a

ripe state they will not bear shipment to distant points. It is hence evident that the best prices will always be paid for the freshest and most perfect product. Tomatoes from Mississippi beg for buyers in the streets of Philadelphia in February, at ten cents a box, while home-grown Tomatoes, from the greenhouses, are in good demand at four times that price. It is better, on the same principle, to sell a half-peck of choice, selected, open-air Tomatoes in August for twenty-five cents to a private customer than to sell a whole basket of unsorted Tomatoes in the wholesale market at the same figure.

The autumn product of Tomatoes is best prolonged by gathering the full-sized fruit in October (as late as the frosts will permit) and ripening in straw under a hotbed sash. The demand for this late fruit is much less than formerly, however, as the greenhouse men now arrange to have Tomatoes ready early in October. See VEGETABLES UNDER GLASS.



GARDEN LINE, WEEDER, TROWEL, DIBBER.

CHAPTER XXI.

THE GOURD KINDRED.

Cantaloupe,
Citron,
Cucumber,
Gherkin.

Gourd,
Melon,
Muskmelon,

Pumpkin,
Squash,
Watermelon.

These plants are closely allied botanically. They are all tender trailing annuals. Most of them have tendrils. The flowers are imperfect; that is, a plant bears only staminate (pollen-producing) flowers, or only pistillate (seed-producing) flowers; or both kinds of flowers may be produced on the same plant—yet each individual flower is imperfect or incomplete.

To perfect the seed the pollen must be carried from the staminate flower to the pistillate flower. This work is naturally done by bees. When these plants are grown under glass the fertilization must be done artificially. A camel's hair brush may be used for the purpose. The process is simple. It is merely necessary to touch the pollen with the brush, and then to touch the pistil. Gardeners carry bees into greenhouses where cucumbers are grown, in order to have the work of pollination done more cheaply and effectually.

The Gourd group includes many curious forms of vegetables, yet the type of growth is quite uniform. There is the widest variety in the color, shape and markings of the pumpkins, the squashes, the gourds and the cucumbers, and a decided tendency toward hybridism all through the group. It is almost impossible, for instance, to draw a sharp dividing line between squashes and pumpkins; and the variety of each is truly unlimited. In general terms, however, the Gourd group is separable into melons, cucumbers, gourds, pumpkins

and squashes. All the members of the group demand warm soil, preferably rather sandy ; and all respond to manure and culture.

In heavy soils it is recommended that underdrainage be provided for by means of coal ashes or otherwise. Careful selection has developed strains of the different "gourds" which are adapted to nearly all good soils.

CANTALOUPE, MELON, MUSKMELON.

A light, rich soil is the proper home for the melon, in all its varieties. The seed should be sowed in May, after the ground has become warm. An ounce of seed will plant fifty hills. Well-rotted manure in the hill is advisable ; but it must be thoroughly rotted—not fresh. Three plants to the hill are sufficient, though six to twelve seeds are usually put in. The hills should be four feet apart, with from four to six feet between the rows, depending on the variety. The young plants are benefited by pinching off the tips, when the plants are a foot or two in length, in order to encourage a branching habit. The plants can be started on small pieces of inverted sods, in hotbeds, if desired, in order to secure earliness.

Jenny Lind and Golden Jenny are reliable early varieties. Cassabah is the largest muskmelon grown. Triumph is one of the best new melons. Netted Pineapple or Nutmeg, Hackensack, Emerald Gem and Miller Cream are reliable sorts.

New Jersey produces melons in abundance and perfection. Pennsylvania soil is well suited to certain varieties. Martin McTigue, gardener at St. Joseph's Convent, Chestnut Hill, Philadelphia, plants Jenny Lind for an early melon, but depends mainly on Netted Pineapple. He sows the seed the middle of May, in hills four feet apart, the rows being five feet apart ; four plants to the hill. The hills are prepared by incorporating rotted manure and sand with the soil. Mr. McTigue's crop is very satisfactory.

Ernst Schreiber, gardener to W. L. Elkins, Ashbourne, Pa., uses Jenny Lind, Golden Jenny and Emerald Gem. The soil is rather heavy. The melons are sometimes started in pots and sometimes in the open air. In 1896 the hills were made six feet apart each way, and twelve seeds to a hill were planted April 25. During cold nights the hills were covered with boxes with glass tops. In preparing each hill a hole $1\frac{1}{2}$ feet deep was dug, and a foot of rotted manure put in, and covered with six inches of soil. Three plants were left in each hill. As soon as five or six leaves were formed the tip of each plant was pinched off, to encourage branching, "as cantaloupes do not fruit on the main stem." After the setting of the fruit the terminal buds were again pinched off, to hasten maturity. In addition to the manure under the hill, a little chicken manure and a little fertilizer were used to stimulate the growth of the plants. After the plants had made a fair start the "hill" was formed by drawing earth to the stems with a hoe. This method of using a large amount of manure under the hill would be too drying in its effects for a light, sandy soil.

Mr. Schreiber planted cantaloupes among onions in 1896, with good results. The onions of course came off early, and left the ground clear for the vines. The experiment was very satisfactory. The Cantaloupes were planted about the middle of June and bore until the first of October. It was Mr. Schreiber's opinion that the onions kept the striped bugs away from the young Cantaloupes.

CUCUMBERS AND GHERKINS.

The preparation of the soil recommended for Cantaloupes will apply as well to Cucumbers. Three or four plants to the hill, and the hills four feet apart each way, with rotted manure in each hill—such are the requirements.

The Improved Early White Spine is an old, reliable market favorite, adapted to the open air or to frames. The

Long Green or Jersey Pickle is a standard sort for pickling. The Small Gherkin or Burr is used only for pickling.

The English forcing cucumbers are now widely known in America, but are grown mainly as winter crops, under glass.



GHERKIN.

An illustration made from an 1896 photograph (see chapter on irrigation) shows how the New England gardeners water their Cucumber vines in the open field to keep them in growth and productiveness.

Cucumbers are sometimes attacked by aphides or green lice in the open field, causing a curling of the leaf and loss of vitality of the plant. Or, to reverse the proposition, it may be true that cold, unfavorable weather stunts the Cucumber without injuring the aphids on the under side of the leaf. Cucumbers in the southern part of New Jersey were thus affected in 1896. The suggested remedy is later planting and higher culture, with irrigation to encourage growth.

The striped beetle is one of the worst enemies of the young Cucumber, and it is common practice to plant a dozen seeds in a hill to allow for loss by insects. Paris green in flour is sometimes used against this beetle. Tobacco dust is perhaps as effectual as anything else.

It is necessary to pull Cucumbers as soon as they are grown, whether needed or not; otherwise they take the strength of the plant for the development of their seeds, and check the bearing habit of the parent vine.

WATERMELON AND CITRON.

Eight feet each way is about the proper distance for Watermelon hills, as the vines occupy much space. A sandy soil is preferable, and a high temperature is essential to growth. Sweet Heart is one of the new watermelons. Dixie, Mountain Sweet, Kolb Gem, Cuban Queen, Boss, Ice Cream

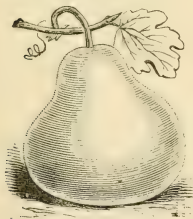
and Ironclad are well-known types. The so-called Citrons are closely allied to Watermelons. Colorado Preserving Citron is a good variety.

The culture of Watermelons in New Jersey, where the soil is favorable, is an industry of wide importance. Fields of these melons many acres in extent are grown there, and the product shipped to Philadelphia and elsewhere. When the season is favorable the crop is profitable, but sometimes (as in 1896) wide areas suffer from what is variously termed blight, wilt or watermelon disease. The vines die suddenly, without apparent cause, the result of a stem fungus. The remedy is burning the old vines and planting in new soil.

Martin McTigue, gardener at St. Joseph's Convent, Chestnut Hill, Pa., prepares hills the same as for Cantaloupes, six feet apart each way. He finds the Mountain Sweet variety suited to his soil. He grows melons weighing twenty pounds.

The seed planting date is the same as for Cantaloupe; about the middle of May, after the weather has become warm and settled.

GOURDS.



A GOURD.

Gourds run into all sorts of odd shapes, from that of a "nest egg" to that of an "Indian club." They are curious rather than useful, but are so ornamental that they are worthy of a place either in the flower garden or among the vegetables. They are all warm weather growers. Most of them are climbers.

PUMPKINS AND SQUASHES.

It is almost as difficult to tell the difference between a Pumpkin and a Squash as between a Cantaloupe and a Muskmelon. The Squash, as a rule, has a thicker stem, a

harder skin, a deeper flesh and a finer grain than the Pumpkin. The former, by the same general definition, is better fitted for human food than the latter. But the two things, Squash and Pumpkin, approach each other very closely in certain forms. The so-called Cashaw and Cheese Pumpkins are almost identical with certain crook-neck Squashes. The Connecticut Field Pumpkin, commonly grown in the corn-fields of Pennsylvania and New Jersey, is clearly a "pumpkin," adapted chiefly to cow-feeding purposes.

SQUASHES. Squashes and Pumpkins demand merely good soil and warm weather for their growth. They are rank growers, and the bees fertilize their blossoms.

The Squash tribe includes a long list of good food plants. The Early White Bush should be planted three or four feet apart each way, and the running kinds six to eight feet apart. Three plants to the hill should be allowed to grow, though more seeds are always planted, to allow for insect attacks. Golden Custard Bush and Yellow Summer Crookneck are other early sorts.

Summer and fall varieties include Cook's Favorite, Boston Marrow, Vegetable Marrow, Hubbard, Marblehead and others. Winter or long-keeping sorts include Pike's Peak, Mammoth Chili and Bay State.

The Squashes have high merit for use in the kitchen, and are equally available for the stable, except the extra-hard-shelled sorts, which must be chopped fine if fed to cows.

The crook-neck varieties of both Squash and Pumpkin are especially available on the farm, as they are good keepers and make excellent food for both man and beast.

Something more will be said about Pumpkins and Squashes in Chapter XXVIII.

CHAPTER XXII.

LILIES IN NAME.

Asparagus,
Chives,

Garlic,
Leek,

Onion,
Shallots.



LEEK.

The vegetable garden members of the great lily family are several. The list includes Asparagus, Chives, Garlic, Leek, Onions and Shallots. These plants are not all lily-like in appearance, but are grouped together by botanists on account of their blossom shapes. They belong to the great botanic order called Endogens, along with the grasses. Corn belongs to this order, and is a grass in fact. Most of the garden vegetables and fruits are classed in the order called Exogens. The common vegetable garden members of the lily family are hardy. As-

paragus and Onions (including Shallots) are treated in other chapters.

CHIVES. Chives are closely allied to Onions and Garlic, and are the smallest onions in cultivation. They are perennial and perfectly hardy, and are easily grown. The tops are used for flavoring purposes, and may be cut several times during a season. Chives are propagated by division of the root clumps, and should be set in clusters nine to twelve inches apart. The tops are often eaten raw.

LEEK. This vegetable is an onion in fact, though the stem rather than the bulb is eaten; in fact, there is no great bulb development. The plant is quite hardy and of easy

culture, demanding light, rich soil. Sow in April, in rows a foot apart; the seed an inch below the surface. When the plants are six inches high transplant to permanent rows, a foot apart, and six inches apart in the rows. The young Leek should be planted deep, so as to blanch the neck. Seed may be sown in August or September, and the transplanting done in the spring. Great quantities of Leeks are wintered over in the open ground near Philadelphia and New York, and give bright color to the autumn and winter gardens. Large American Flag and Giant Carentan are favorite sorts.



GARLIC.

GARLIC. Garlic is another member of the Onion family that is largely grown by market gardeners. The divisions of the bulb are called "cloves" or sets, and these are planted in rows twelve inches apart, with the sets six inches apart in the row. It is

grown in considerable quantities at Philadelphia, and is harvested and treated much like the Onion. As soon as the leaves turn color the crop is mature, and may be harvested. As a flavor Garlic is more pungent than Onion.

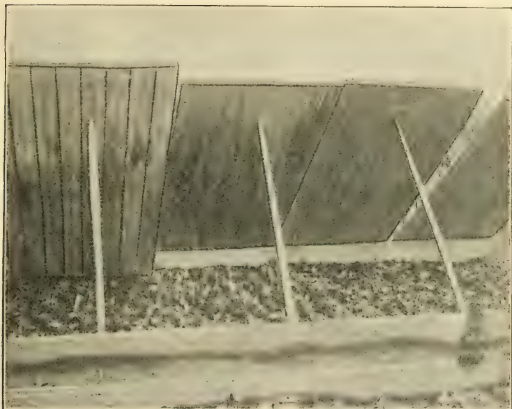
CHAPTER XXIII.

THE GOOSEFOOT TRIBE.

Beet,
Mangel Wurzel,

Chard,
Spinach,

Orache.



SPINACH UNDER LIDS OR SHUTTERS.

Thomas Dwyer, gardener to Dr. J. A. DaCosta, Villa Nova, January 4, 1897.

The plants embraced by the "goosefoot" family are, according to Dr. Gray, "chiefly herbs of homely aspect." The botanic name of the family is *Chenopodiaceæ*. It includes a number of common weeds, such as goosefoot, pigweed, lamb's quarters, etc. It also includes such garden vegetables as beet, mangel wurzel, chard, spinach and orach. These are all "herbs of homely aspect." They are quite hardy, but not all frost proof.

BEETS AND CHARD.

High fertility is needed for beets. The rows may be a foot apart, for hand work, or two and a half feet apart for horse work. An ounce of seed will sow fifty feet of drill; or five to six pounds of seed to the acre. Light soil is preferable for beets; the more highly manured the better. The plants must be thinned out to stand four to six inches apart in the row. Beets six inches apart will mature much more quickly than if standing three inches apart. Sowing may continue from the earliest spring until July. High culture is demanded. The seeds are usually sown with a drill, about an inch under the surface.

The earliest varieties are Egyptian and Crosby's Egyptian, quickly followed by Eclipse, Lentz and Bassano. These varieties are turnip-shaped or round. Excelsior Blood, Bastian's Blood Turnip, Early Blood Turnip and Edmand's Blood Turnip are among the many good sorts now on the market. Early Bassano has flesh that is white and rose colored, and is very sweet. The extra early beets are not quite as sweet as the second-early sorts. The "half-long" sorts are late.



CHARD.

CHARD. Swiss Chard is a beet. The midrib of the leaf is stewed and served as Asparagus, the leaves themselves being cooked and used like spinach. The culture is the same as for other beets.

PRICES. Prices of beets are very variable. The earliest products of hotbeds and frames reach

high quotations—10 to 20 cents a bunch, wholesale. From these figures the price quickly drops to \$2 to \$3 per hundred bunches, depending on weather and conditions. The early

bunches require seven or eight beets, while five beets make a full-sized bunch in late spring and summer. But when it is remembered that an acre planted twelve inches by six inches will yield over 75,000 beets, it is easy to figure out large gross receipts from the crop. The cost of growing is considerable, however, and the market gardeners make only fair profits. The ground can be cleared and used for another crop the same season.

Beets vary in their habits somewhat in different soils, and no better advice can be given inexperienced persons than to urge a fair comparative trial of all the standard types. It costs no more to grow ten kinds of beets than one kind, so far as culture and care are concerned.

WINTER STORAGE. For preservation during winter a root cellar affords the greatest convenience. The beets should be covered with sand in the cellar, and well ventilated during suitable weather. Or they may be kept in heaps in the open field, preferably packed in sand. The heap should be given a roof-shaped pitch on all sides, and covered with straw laid so as to shed water. Upon the straw the soil must be heaped to a depth of eight or ten inches.

TESTIMONY OF GEORGE SHALLCROSS. George Shallcross lives on the Bustleton pike, above Frankford, Philadelphia, and grows great quantities of beets for the wholesale market. "Good seed is the main thing," says Mr. Shallcross; the "main thing," it will be observed, after using from forty to sixty tons of rotted city manure per acre on the land for beets, "with a little fertilizer to start things." This is Mr. Shallcross' system.

On the 15th of June, 1896, Mr. Shallcross was in his beet patch making ready for market. A portable table had been set up, and the beets were tied and topped in the field, the washing being done afterward. This method avoids the carriage of tops and part of the soil which adheres to the beets when pulled.

Lentz is a favorite variety. Egyptian and Eclipse are grown under glass. Bastian's Half-long is used for a late beet.

Mr. Shallcross sows beets in the open air just as soon as possible—April 1 to April 5. The rows are made one foot apart, and the plants left five inches apart in the row. Mr. Shallcross leaves them six inches apart "if in a hurry," or four inches apart "if not in a hurry." His average distance is five inches, as quoted.

The stable manure is fermented for the double purpose of killing weed seeds and getting more manure into the ground. Rotted manure is much more available for plant food than in its fresh condition.

SUGAR BEETS.

The Sugar Beet industry in the United States is on the increase. Factories for making beet sugar have been established in California, Utah and Nebraska, and others have been proposed. The principal use of the Sugar Beet in the eastern part of the United States at the present time is for stock-feeding purposes, for which it is well adapted. Various amounts of seed per acre are recommended, depending on the planting distance and intended method of culture. In three-foot rows, for horse culture, six or eight pounds per acre will be needed. In closely-planted patches seed is sometimes used to the amount of twenty-six pounds per acre.

High manuring the previous year and subsoiling are recommended for Sugar Beets. Farmers' Bulletin No. 3, U. S. Department of Agriculture, suggests wheat, beets, clover and potatoes as forming a scientific rotation.

MANGEL WURZEL.

This crop is a highly important one in stock-feeding operations. It is a farm product, and has no especial place in the economy of the market garden. It is often grown in private gardens as a food for the family cow. It demands deep soil and high culture.

The Mammoth Long Red is one of the best red types and Golden Tankard a good yellow variety. The rows should be thirty inches apart for horse culture. Mangels are preserved in root cellars or by burying, and should not be fed until after a period of storage, which ripens them and makes them more digestible. They make a good food for animals, especially cows and sheep, if not fed in excess. They are best in quality when not too large in size. The remedy for over-growth is close planting—say six inches apart in the rows.

SPINACH.

Spinach is one of the most hardy members of the "goose-foot" group of vegetables. It is grown for its leaves, which afford excellent "greens" in fall, winter and spring. It is grown both under glass and in the open air—usually on the latter plan.

The cultural requirements are simple. In good soil it may be sown broadcast from August until October. That which is sown first will be fit for market all winter, if protected with a little straw; provided a snow fall does not make it inaccessible. That sown in October will be small, and will not be ready to cut until spring. Spinach seed sown in early spring will yield a quick crop, but warm weather will cause it to speedily run to seed.

Spinach is sold by measure, an average retail price being fifteen cents per half peck. When sold by the barrel, wholesale, it commands but a fraction of that price. It is grown by the acre near all large cities. Indeed, whole fields of it are grown for the autumn markets.

To prepare it for sale the whole plant is cut off at the root. Dead or yellow leaves are removed, and it is carefully rinsed in clean water. Prepared thus it sells readily, though the price is often quite low. Frequently, however, spinach is scarce, and it then commands high prices.

The Rhode Island Station issued a bulletin on Spinach in November, 1896. Thirty-six different varieties were tested, obtained from seedsmen all over the United States. These several sorts resolved themselves into six groups, during the progress of the trial, as follows :

1. Norfolk or Bloomsdale Spinach. Plants more or less vase-form ; leaves broad, thick and self-supporting, and not naturally resting upon the ground. Soon running to seed.

2. Round-leaved Spinach. Plants compact in habit ; leaves rounded in outline and formed close to the ground. A slow-growing sort, as compared to other types. Blossom stalks form tardily.

3. Thick-leaved Spinach. Plants large ; leaves long and spreading out upon the ground ; ends and lobes of leaves more or less pointed.

4. Prickly Seeded Spinach. Plants variable. Leaves often with long and slender stalks and rather narrow blades. Seeds with horn-like projections.

5. New Zealand Spinach. Plants diffusely branched, often three or four feet across, with leaves resembling those of the true Spinach in appearance.

6. Mountain Spinach or Garden Orache. Plants sometimes four feet high, with lateral branches. Leaves light green or dark red.

Of the first group Dreer's Round Seeded Savoy is a type. Victoria and Long Standing Round Seeded are types of the second group, Catillon Long Standing of the third group, Prickly Seeded of the fourth group, and New Zealand of the fifth group. The sixth group is not always mentioned in seed catalogues, though Orach or Orache is not a new thing in the vegetable garden.

Among the conclusions of the Rhode Island bulletin are that Norfolk Spinach is too liable to go to seed early ; that Round-leaved Spinach is of firm texture and ships well ; that Thick-leaved Spinach is particularly valuable for a near market.

New Zealand Spinach is not closely related to the true Spinach botanically, nor is it a plant of similar habits, but it makes a good substitute for Spinach, and can be grown to perfection during the hot months.



NEW ZEALAND SPINACH.

Mountain Spinach or Orach has a peculiar flavor, and is not always liked by people accustomed to true Spinach, to which it is botanically related.

DISEASES. As Spinach demands a rich soil, involving the use of heavy coats of manure, it is subject to several diseases, mostly fungous in character. The best remedy is a new location, with rotation of crops.

CHAPTER XXIV.

THE COMPOSITES.

Artichoke—Globe,
Artichoke—Jerusalem,
Cardoon,
Chicory,
Dandelion,

Endive,
Lettuce,
Salsify,
Salsify—Black,

Sunflower,
Tansy,
Tarragon,
Wormwood.



The composite-flowered vegetables are mostly hardy. Lettuce is the most important member of the group. The blossom type is peculiar, the flowers being what the older botanists called compound. In other words, each so-called flower is a collection of several or many individual flowers. The Chicory is a good example.

ARTICHOKES.

The two commercial Artichokes, Globe and Jerusalem, are of wholly different types. The former furnishes edible buds or heads; the latter edible tubers. Jerusalem Artichoke is merely a tuberous-rooted sunflower.



GLOBE ARTICHOKE.

GLOBE ARTICHOKE. The edible portion is the undeveloped flower head. After the head unfolds it is unfit for use; and if the heads are not removed the plant ceases to produce new buds. The heads are tender and fleshy, and are boiled, and served with butter, pepper and salt. The plant is a perennial. The seed should be sown an inch and a half deep, and thinned out to a foot apart in the row. The next spring the plants should be set in a permanent bed, at distances of two by

three feet. A deep, rich loam is demanded, and the plants need winter protection. Large Green Globe is the best kind for general culture.

John Ward, gardener to Mrs. John Bohlen, Chestnut Hill, sows Green Globe Artichoke in hills three to five feet apart, where it is to remain, and leaves three plants to a hill. Manure is freely used. Mice prove to be a serious enemy, in his experience. Winter protection with straw is required.

JERUSALEM ARTICHOKE. This is entirely distinct from Globe Artichoke. It is multiplied by planting the tubers, which somewhat resemble potatoes. The tubers are used for pickles, and sometimes for stock-feeding purposes. If neglected it sometimes becomes a weed, as it is a hardy perennial, and has a tendency to escape from cultivation. It sometimes takes possession of fence corners or other unoccupied ground.



CARDOON.

CARDOON.

A rank, rough, hardy perennial, highly esteemed for the midribs of the leaves, which are used for salads, soups and stews after blanching. It is bleached with earth, like celery. The seeds may be sown in April, for transplanting into permanent quarters the following year; or the seed may be started in rich, highly-manured trenches, and allowed to remain there. The plants should stand a foot apart in the rows, the rows themselves being three feet apart. Cardoon grows three or four feet high. The leaves are tied together previous to blanching. Large Smooth Solid is the best variety.

CHICORY.



CHICORY.

The two sorts of Chicory are the Common or Wild and the Large Rooted. The former produces the "Barbe de Capucin," a French salad. The latter is used as a substitute for Coffee.

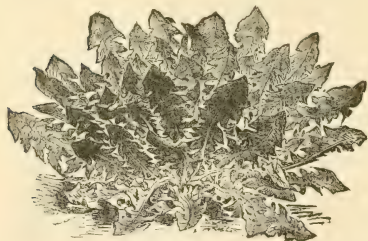


CHICORY.

The seed of Common or Wild Chicory may be had at the seed stores. Sow in June, and transplant in autumn to a warm cellar, in sand. The young shoots form the salad-making material.

The Large Rooted Chicory is cultivated like carrot, and is used for mixing with coffee.

DANDELION.



DANDELION.

Dandelion has become a garden staple, and is grown by the acre, especially near Boston. Broad-leaved and Improved Thick-leaved are good varieties, the latter being in highest favor.

Dandelion is a per-

ennial, and requires over a year to mature. It resembles Endive in general appearance. It is used as a salad or for "greens," and is a good and wholesome article of food.

Mr. Rawson says that a rather sandy soil, not too rich,

is best for Dandelion growing at Boston. The rows should be twelve inches apart, and the seeds covered about one-fourth of an inch deep. Under glass the rows are made but six inches apart. It is marketed like spinach—thirteen pounds to the bushel. Mr. Rawson says that when prices run high (\$1 per bushel) the proceeds per acre reach \$1000; and that at fifty cents per bushel the crop is a paying one. It is commonly grown throughout the eastern part of New England. It is sown in early spring, sometimes in alternate rows with spinach.

ENDIVE.



ENDIVE

Endive is a standard salad-making vegetable for autumn and winter use. It is also employed for ornamental or advertising purposes at the restaurants during cold weather, on account of its color and beauty. An ounce of seed is sufficient for

150 feet of row. It may be sown in April for early use, and in June or July for autumn use. The plants must be thinned out to a foot apart in the row, or young plants may be set out from a seed-bed. The blanching is done by gathering the leaves together and tying with yarn or raffia, so as to exclude the light from the heart of the plant. The effect is that the inner leaves all become white, while the outer leaves are green. A board is sometimes laid flat on the Endive plant, to produce the same result. The plant must be handled only when dry, or the leaves will rot. Endive will endure a good deal of frost.

Reliable varieties of Endive are Green Curled Winter

and White Curled. The latter is the "chicory salad" of the restaurants. Broad-leaved Batavian Endive is sometimes called Escarolle, and Giant Fringed is sometimes called Oyster Endive.

LETTUCE.

This is by far the most important member of the Composite group of vegetables. It has a deserved place in all gardens, both large and small, during the summer season. See Chapter XIV.

SALSIFY AND BLACK SALSIFY.



MAMMOTH

SANDWICH ISLAND SALSIFY.

Martin Geary, gardener to
Frederick W. Morris, Villa Nova,
Pa., January 4, 1897.

Salsify, or Oyster Plant, or Vegetable Oyster, is an excellent thing during the winter months. It is sowed and grown like the carrot. It is hardy, and can be left in the ground all winter, if desired. It thrives best in a well-enriched, mellow soil. It should be sown early in spring, one inch below the surface, in rows fifteen inches apart, and thinned out to six inches in the row. Mammoth Sandwich Island is the leading and best type. Long White is an older variety, and by some growers held in highest esteem.

Black Salsify, or Scorzonera, resembles ordinary Salsify, and is grown in the same way, but mostly by private gardeners.

Martin Geary, gardener to Frederick W. Morris, Villa Nova, Pa., sows Salsify May 1. In 1896, being short of manure, he opened a furrow with a small plow and used chicken manure and coal ashes in the row, and also some wood ashes. The

Salsify seed was sown in rows two and one-half feet apart, and the plants thinned to five inches in the row. Cultivation was freely given, the ground being worked after every rain. The results were very satisfactory. The engraving in this chapter was made from a bunch of Salsify grown as described. It was a bunch made from roots taken from the ground in January, 1897, the individual roots being an inch and a half to two inches in diameter.

SUNFLOWER.

This has but small claim to recognition in the vegetable garden, but is sometimes planted for ornamental purposes or for poultry food. The Mammoth Russian is the leading variety. The Sunflowers are annuals, but their stems are hard and woody.

TANSY, TARRAGON, WORMWOOD.

Tansy is a hardy perennial herb used sometimes for medicinal purposes. It bears a yellow flower, and is quite ornamental in appearance. It has aromatic foliage. It is not exterminated by neglect.

Tarragon is a hardy perennial, cultivated for its leaves and young shoots, which are used for flavoring salads, soups, pickles, etc. Tarragon vinegar, in high esteem as a sauce, is made by putting Tarragon leaves into common vinegar. The plant is propagated from seeds or root cuttings.

Wormwood is a hardy aromatic shrub, sometimes used in medicine.

CHAPTER XXV.

THE PARSLEYS.

Anise,
Caraway,
Carrot,
Celeriac,
Celery,

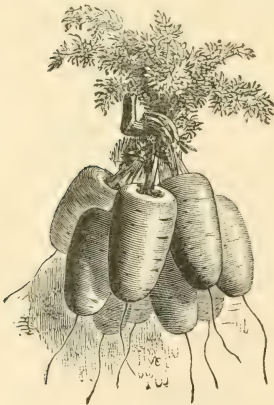
Chervil,
Coriander,
Cumin,
Dill,

Fennel,
Parsley,
Parsnip,
Sweet Cicely.



The Parsley family, called the Umbelliferæ by botanists, is a large and important one. The flowers are much alike, and classification is based upon the seeds. Some of the plants are poisonous and some innocent. Some are poisonous when wild and harmless when under cultivation, like the parsnip. Of the above-mentioned plants four are of high importance in the vegetable garden. These are Carrot, Celery, Parsley and Parsnip. Celeriac and Chervil are also much grown, while the others are less common. The family is a hardy one.

CARROTS.



EARLY SCARLET HORN CARROT.

The market gardeners appreciate the Carrot, and make money with it. The smaller kinds are grown under glass in great quantities, and the larger sorts are also cultivated to a considerable extent. The miniature Carrots are sold alone or with pot herbs.

The Philadelphia market men sow Carrot seed in October, in cold frames, and mature the roots the following May. Lettuce or Radish between the

rows adds to the profits of the Carrot crop. Early Scarlet Horn and Half-long Nantes are useful for either fall or spring planting under glass ; also for the open air. Danvers Half-long is an excellent sort for the first open-air sowing in April. St. Valery and Nichols' Improved Long Orange are reliable late or field types.

One ounce of seed will sow 150 feet of drill ; or three to six pounds per acre. The best soil is a deep, rich, sandy loam, without too much manure. The early sorts may be sowed from early April to the end of May, in rows a foot apart, and the plants thinned to three or four inches in the row. This system of planting demands hand work.

The main or field crop should be sowed in June, in rows far enough apart to permit of horse work. In this planting, as the weather is often dry, great care should be exercised to roll or tramp the drills, in order to compact the soil about the seeds and insure germination.

CELERY.

This crop is one of great money importance. For details the reader is referred to Chapter XIII of this book. A new Celery not there described is the Rose-ribbed Paris. It is a sport of the Paris Golden Self-Blanching, and has the same clear color, but the ribs are a pretty shade of rose. It was grown in perfection by R. B. Plumley, Lincoln University, Pa., in 1896, and shown in well-bleached and well-preserved form during the succeeding winter. (Dreer Note-Book, Lincoln University, December 12, 1896).

PARSLEY.

Parsley is grown largely in winter under glass, as well as during the warmer months of the year in the open air. It is almost hardy. Some Philadelphia gardeners carry it nearly or quite through the winter under a covering of straw, but as it quickly runs to seed the second season this practice merely yields extra late and extra early leaves. It must be sown

each spring for open-air work, and as it germinates slowly it is best to get the seeds into the ground very early. It should be sowed in rows a foot apart, one-fourth inch deep, and thinned to five or six inches apart in the row to get large plants. The seeds should be soaked before planting. There are many varieties on the market. Half Curled and Dwarf Extra Curled Perpetual are good sorts. Parsley is the prettiest garnish afforded by the garden. Its sale in the city markets, both winter and summer, is almost unlimited. Market gardeners sometimes build temporary frames over out-of-doors beds, and cover the Parsley with glass sashes in autumn or early winter. The plants can be carried over winter in this manner.

PARSNIP.

Parsnips require a deep soil for their full development. They are perfectly hardy, and may be left in the open ground all winter, just as they grow in the rows. The seed is light. An ounce will sow 200 feet of drill. The quantity required for an acre is five or six pounds. The sowing should be done in early spring, and the plants thinned out to six inches in the row. If hand culture is intended the rows may be 15 inches apart; or three feet apart for horse culture. The seed should be placed about half an inch under ground. Good culture is demanded. The crop is a slow one, and is suited to the farm rather than to the market garden; though Parsnips should be grown wherever the market demands them. Freezing improves rather than injures their flavor. They naturally run to seed the second season. Large Sugar or Hollow Crown is a standard sort. Student or Guernsey is another valuable type. Parsnips are used to some extent for stock food.

CELERIAC.

Celeriac is a turnip-rooted Celery. The seed should be sown the same way as Celery seed, and the young plants set out in rows two feet apart and nine inches apart in the row.

Thorough cultivation is necessary. It is preserved in winter by banking with earth. It is grown to a considerable extent in the Philadelphia market gardens. It is eaten either cooked or raw. In the latter case it makes an excellent salad.



WASHING CELERIAC.

William Backus, Evergreen, Long Island, October 30, 1896.

The illustration is from a Dreer photograph, taken on Long Island, a few miles from Brooklyn. As shown in the picture, three stalks of Celeriac make a bunch.

Apple-shaped is a standard variety of Celeriac; also Giant Smooth Prague.

SOME OTHER "PARSLEYS."

The following should be sown in rich, mellow ground, in spring. Some are annual; some perennial. They are all aromatic and pleasant, and if cut and dried just before coming into full blossom, when at their greatest vigor, they are excellent for medicinal or culinary purposes. For other "herbs" see chapter on Mints.

ANISE. An annual ; for garnishing and flavoring.

CARAWAY. A perennial ; for confectionery, medicine and flavoring.



CHERVIL.

CHERVIL. An annual much resembling Parsley ; used as a salad and for seasoning soups. Curled Chervil is a good variety.

CORIANDER. An annual ; grown for its seed and also for garnishing ; two feet apart.

CUMIN. An annual ; good for pigeons.

DILL. An annual ; used green in soups, sauces and pickles ; also used as a seed for flavoring.

FENNEL. A perennial ; leaves boiled and used in fish sauces.

SWEET CICELY. A perennial sometimes grown in gardens, of pleasant taste. Native to American woodlands.

CHAPTER XXVI.

THE MINTS.

Balm,
Horehound
Lavender
Mint.

Rosemary,
Sage,
Savory,

Sweet Basil,
Sweet Marjoram,
Thyme.



The flowers of this group of plants are more or less conspicuously two-lipped. The number is large, many being omitted here. A few are commercially important, though a majority belong with the less common herbs. Mint, Sage and Thyme are largely grown by Philadelphia market men.

MINT.

This herb (the Spearmint of the meadows, or a slightly improved type) is now an important thing in under-glass work. It is in demand all winter and also in early spring, and its use is apparently increasing. The seedsmen are now prepared to answer calls for it. It is grown from root-cuttings. It is a perennial, but requires renewal.

SAGE.



SAGE.

Sage is a perennial herb grown in large commercial quantities. Its culture is simple and easy. There are several varieties on the market, variously named, as Common, Red, Purple, etc. It may be bought as seeds or as young plants. The plants should be set about two feet apart, to give room for development. The leaves are dried and used for flavoring, for which purpose it is unexcelled.

THYME.

The two varieties most commonly grown are Broad-leaved English and French Summer. The Philadelphia market men start Thyme in seed beds, and transplant to the open ground in rows a foot apart, with plants about the same distance apart in the rows. Large patches of Thyme are grown in this manner.

OTHER "MINTS."

The other members of the sweet-scented group mentioned above are of less comparative commercial value. They should be sown in spring, in good soil, kept free from weeds, and cut for drying just before they blossom.

BALM. A perennial; used medicinally.

HOREHOUND. A perennial; used medicinally.

SWEET BASIL.

LAVENDER. A perennial; a valued aromatic herb.

ROSEMARY. An aromatic perennial.

SAVORY. The summer variety is an annual; the winter variety a perennial. Used for seasoning.

SWEET BASIL. An annual; used for flavoring.

SWEET MARJORAM. An annual herb used for flavoring. American-grown seed is best if leaves are to be dried; imported seed is best if leaves are to be used green.



CHAPTER XXVII.

A MIXED CLASS.

Bene,
Borage,
Caper,
Chufa,
Corn Salad,
Gombo (see Okra),

Martynia,
Mushroom,
Nasturtium,
Okra,
Rhubarb,

Rue,
Sorrel,
Strawberry,
Sweet Corn,
Sweet Potato.



CONVOLVULUS TYPE.



STRAWBERRY TYPE.

Half the members of this mixed class are of major importance in the vegetable garden; the remainder are of minor importance, commercially speaking. The convolvulus type of flower, shown on the left, fits the Sweet Potato, and the rose type of flower on the right belongs to the Strawberry; but the grouping of all these things in a chapter is wholly artificial, and without botanical significance. Strawberries and Sweet Corn have been treated in detail in earlier chapters, and will not be again mentioned here.

CORN SALAD.

This hardy salad-making vegetable belongs to the Valerian family. It is grown in considerable quantities near Philadelphia under almost exactly the same cultural treatment as lettuce, which it somewhat resembles. Being rather smaller, the plants may be set closer together than lettuce. Six to eight inches each way is a good planting distance. It is frequently called Feticus. It is used mostly in winter and spring, and is often grown under glass in frames. The seed may be sown in September in the open ground, and the young plants carried through the winter under a light protection of straw, like spinach. Large-seeded Corn Salad is a reliable variety. See VEGETABLES UNDER GLASS.

MUSHROOM.

The open-air cultivation of the Mushroom is not a reliable method, on account of our changeable weather. The "seed" of the Mushroom is commercially called spawn. This substance, broken into bits and placed in the sod of a lawn or old field, results in a growth among the grass roots of a bluish-gray, mouldy-looking material which soon becomes thread-like in appearance. This growth is the Mushroom plant, from which in due time the Mushrooms will be produced on the surface. The Mushroom of commerce is (or corresponds to) the blossom or flower of an ordinary plant. The real plant is wholly beneath the soil.

The spawning of a field or lawn is an uncertain operation, from the fact that if a shower of rain comes at the critical moment of early growth the spawn dies. Out-of-doors Mushrooms are only common after long periods of dry weather. The dormant spores or seeds of Mushrooms (which are infinitely small) are probably in existence in old sods at all times. Protracted dry weather in July and August gives just the right temperature and moisture among the grass roots for starting the growth of the Mushroom plant (commonly called mycelium or spawn).

The cooler weather of September, after the mycelium has become strong, favors fruitage. Mushrooms come to the surface and are greatly helped by the autumn rains. It is during the delicate period of early growth, when the reawakened spawn first starts to spread or run, or when the spore first begins to develop, that injury is most liable to occur. This is the reason why Mushroom growing is more profitably done under artificial conditions than in the open air.

To succeed in growing Mushrooms it is only necessary to act in accordance with the simple requirements above set forth. The spawn runs best in a temperature of 70° to 80°,

in a bed (sod, for instance) that is comparatively dry, yet still moist. The Mushroom fruits best in a temperature of 55° to 60° , and water is an absolute necessity during the period of bearing—as necessary then as it was unnecessary when the spawn first started to run.

A heap of sods, such as the florists make in order to get potting earth, sometimes produces an abundant supply of natural or spontaneous Mushrooms in late autumn and even during the winter.

Experiments in spawning sod piles or lawns are fully warranted, provided no commercial dependence is placed upon the result, as there are many chances of complete or partial failure. Hostile fungi may destroy the spawn, or the temperature may be wrong, or the moisture excessive or the reverse.

The demands of the Mushroom are as precise as they are simple. Brick spawn is the best for nearly all purposes.

NASTURTIIUM.

This plant is grown as a flower and as a vegetable. It has a place in both gardens. It belongs to that curious group called the Indian Cress family, of South American origin. Nasturtiums are usually planted in warm borders, and are prized for their richly-colored flowers and their pungent fruit.



DWARF NASTURTIIUM.

John Gaynor, elsewhere quoted, sows Nasturtiums in rows twelve inches apart and the plants nine inches apart in the row. This favors good cultivation and greatly increases blooming and fruit-setting ability. The tall-growing varieties are cut back, in order to induce them to bear flowers and seeds instead of excessive foliage. Tall Mixed and Dwarf Mixed are commercial names for desirable kinds of Nasturtiums, the name describing the habit.

OKRA OR GOMBO.



OKRA.

This vegetable is grown for its pods, which are used in soups and stews. It is a member of the *Malvaceæ*, or Mallow family. The seed should be sown late in May, in the open ground, and the plants allowed to stand ten or twelve inches apart in rows three feet apart. White Creole is grown largely in the South. Improved Green is a standard sort with market gardeners at Philadelphia. Dreer's Little Gem is among the best of the dwarf sorts.

Robert G. Carey, Chestnut Hill, Philadelphia, gardener to Thomas C. Price, sows Okra about the first of June, after the ground has become warm, with successional plantings every three or four weeks. The pods must be pulled for use while still soft enough to cut easily with a knife.

RHUBARB.

Rhubarb, or Pie Plant, is grown in far larger quantities than is generally supposed, both in the open air and under glass. Its pleasantly acid taste gives it a market value in the late winter and spring months. It is usually grown from a division of old roots, but may be had directly from the seed, though the latter operation is slow, requiring two or three years. Linnæus and Victoria are standard varieties. St. Martin's is a somewhat different type.

Forced Rhubarb commands from \$8 to \$10 per 100 bunches, wholesale, for the first. The cold frame product commands \$4 per 100 bunches, wholesale. Open-air Rhubarb is worth from \$1 to \$3 per 100 bunches, wholesale.

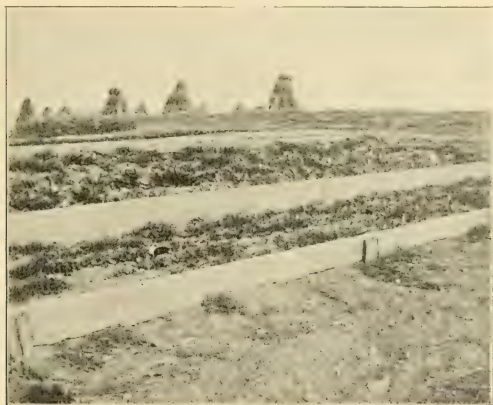
Samuel Waters, a market gardener on the Bustleton

turnpike, above Frankford, reported, June 15, 1896, that Rhubarb was bringing him \$1.50 per 100 bunches, wholesale ; " more than we can get for beets." He was using six stalks to the bunch.

Rhubarb is a member of the Buckwheat family of plants.

SORREL.

Sorrel belongs in the Polygonaceæ or Buckwheat family, and is closely related to the dock. It is a perennial, hardy plant, used in much the same way as spinach. It is grown at Philadelphia, New York and elsewhere, and is purchased largely by our foreign population. Large-leaved Garden is a good variety.



SORREL ON LONG ISLAND.

The engraving is from a Long Island photograph, taken October 30, 1896. It shows Sorrel growing both in a frame and in the open ground ; though, for the matter of that, the

Long Island truckers have a way of building temporary frames almost anywhere in their gardens, so that sashes may be used to carry certain open-air crops quite through the winter.

The cultivation of Sorrel is simple. If sown in early spring it may be cut in June or July. When it runs to seed it must be mowed down, so that a new crop of edible leaves will be produced. It will last several seasons, but it is considered best to replant it every second year or every year.

SWEET POTATO.

The Sweet Potato is a member of the Convolvulaceæ family, and is akin to the morning glory and the moonflower. It is a vegetable of great commercial importance, thriving best in a rich, sandy soil. It is a tender annual, demanding warm weather for its growth. It naturally trails upon the ground.

Sweet Potatoes are propagated from young plants obtained from the tubers. The tubers are laid upon their sides in prepared beds (which must be heated by manure or fire) and covered lightly with soil. The sprouts come up in large numbers, and are easily transplanted.

The production of Sweet Potatoes is a great industry in New Jersey, and thousands of acres in the southern portion of the state are devoted to this crop. Houses or cellars are built especially for storage purposes. The young plants are started in hotbeds or fire beds, and set out in May and June. The New Jersey fire bed is described in VEGETABLES UNDER GLASS.

The rows of Sweet Potatoes in the fields are three or four feet apart, and the plants are set two feet apart in the rows. A little rotted manure in each hill is a great help to the crop. Good culture is demanded, and the vines are carefully lifted and turned, to prevent them from rooting, so as to throw strength into the tubers. The crop is considered a profitable one. Red and Yellow Nansemond are favorite varieties.

PLANTS OF FIVE FAMILIES.



MARTYNIA. The pods of this plant, when young and tender, are used for pickling. The seed may be sown in a hotbed and transplanted, or sown in May in the open air, in hills three feet apart. Martynia belongs in the Bignonia family, and is naturally tender.

BENE. An annual herb, used medicinally. It is a member of the Bignonia family. Oil is made from the seeds. It is sometimes called the oil plant.

MARTYNIA. BORAGE. An annual herb, excellent for bees. A member of the Borage family of plants.

CAPER. A tender plant grown for its buds or its unripe fruit. Used for pickles. It is a member of the Caper family.

RUE. A perennial herb, used medicinally ; a member of the Rue family of plants.

CHUFA. A sedge, bearing small tubers on its roots.

PART IV.

CHAPTER XXVIII.

C. E. VARNUM'S SQUASH TRIALS.



PUMPKINS AND SQUASHES.

C. E. Varnum, Atco, N. J., September 26, 1896.

A field trial of Squashes and Pumpkins, made at Atco, New Jersey, in 1896, is worthy of record. Mr. C. Eddy Varnum, a trucker and fruit grower, desired to obtain strains of Squashes and Pumpkins best suited to his soil and situation. He therefore obtained samples of all the principal sorts from several leading seedsmen and made a comparative test.

This practical method, the simplest that can be devised, is the one most rarely practiced. People generally plant either

according to custom or in a haphazard way. A systematic comparative test costs no more, and yet is sure to yield valuable information. Soils, elevations, exposures and latitudes produce a variety of conditions. Pennsylvania clays are wholly different from New Jersey sands, and nothing except actual test will determine what varieties of fruits and vegetables are best for any particular locality.

Mr. Varnum plowed down two patches of strawberries immediately after the fruiting season, in June, 1896. In one patch he planted a long list of Squashes; in the other patch almost as many kinds of Pumpkins. His soil is a gravelly loam. No fertilizer was used except hen manure in the hills. The several plantings were all carefully marked.

The result, as seen September 21, by representatives of the house issuing this book, was highly interesting. In quantity of yield the result might have been larger if the seed had been planted earlier and fertilized more heavily, but in quality of product the experiment was a complete success. It demonstrated exactly which sorts were best suited to that locality.

The best Squashes were Cook's Favorite, Boston Marrow, Hubbard, Winter Crookneck, Mammoth Chili, Sweet Nut, Essex Hybrid, Pike's Peak, Marblehead, Low's Bay State and Red China.

The best Pumpkins were Large Cheese, Connecticut Field, Tennessee Sweet Potato, Large Tours, Potiron Mammoth and New England Pie.

There is a local significance to the trial, on account of immediate results; but the general significance lies in the fact that the best way to get knowledge is by experience.

CHAPTER XXIX.

SUPPLYING A LARGE INSTITUTION—A TALK WITH JOHN PAGET.



A FROST-PROOF HOUSE FOR STORAGE OF ROOTS AND VEGETABLES, AT
PENNSYLVANIA STATE LUNATIC ASYLUM, HARRISBURG, PA.
DESIGNED BY JOHN PAGET.

John Paget is in charge of the gardening and landscape work at the Pennsylvania State Lunatic Asylum, Harrisburg, Pennsylvania. The institution is a large one, and the duties of the gardener involve the production of immense quantities of vegetables. Mr. Paget brought practical knowledge with him from over the seas, to which he has added a quarter of a century of horticultural experience in America. His ways of doing things will be of interest to readers of this book. The following crude and imperfect notes refer to "A Talk with John Paget" that occurred in January, 1897.

A COMPLETE STORAGE HOUSE. The root and vegetable storage house shown in the illustration was constructed on plans drawn by Mr. Paget. It is 84x40 feet in size, with first story stone. A cart or wagon can be driven directly through the building. On each side of this passage way are large bins, made of boards, with air spaces under them and also separating them from the outer walls. Potatoes, Carrots and other roots are stored in the lower part of the building, which is wholly frost proof. The upper or frame portion of the building is also proof against cold, as the sides are six inches thick and the roof five inches thick, the spaces being filled with coke dust. The windows have inside shutters, and the whole second story is snug and warm. It is used for the storage of large quantities of onions, herbs, etc.

Every large bin in the first story has a ventilating door opening upward into the second story, close to a window, so that the arrangements for ventilation are perfect. The building also contains several small rooms used for other than root-storage purposes. One is a room for seeds, and another is an office.

GENERAL SYSTEM. Provision is made in the Asylum gardens for the economic use of manure produced on the premises. At the hog pen the drainage passes into a manure well, from whence it is distributed by means of a cart especially prepared for the purpose. The general plan is to put all manure on the potato and cabbage patches. Celery always follows potatoes. Manure is used in the hills for Lima beans. Phosphate is used with Corn and Tomatoes. Peas and Beans do not require such rich ground.

PEAS. Three-fourths of an acre is sowed with Peas at each planting. Dreer's Extra Early Pioneer and Pride of the Market are planted the same day, as soon as the ground can be worked. Two weeks later Shropshire Hero, Yorkshire Hero, Heroine and Bliss' Abundance are put in. This planting is repeated every two weeks, until the end of June,

making about seven plantings in all. None are planted in July. In August Extra Early Pioneer is again planted. Advance is sometimes used in early spring, next after the first varieties. No sticks are used.

BEANS. Red Valentine is the only bush bean used. Plantings are made every two weeks, from May until the 15th of August. Lima Beans are grown on poles ; also, Old Homestead. The latter is a green-pod, snap-short cluster bean.

PARSNIPS, CARROTS, ETC. Parsnips, Carrots, Salsify and Okra are sowed the same day, in early spring. All are planted in rows two feet apart, to permit of horse work. The Hollow-crown Parsnip is used ; and Early Half-long Carentan is the only Carrot now grown. These roots are buried in the open field, or stored in the building already described.

Sandwich Island Salsify is grown. In the fall it is taken up, set at an angle of 45° , and covered with earth, like Celery, in the open field. Leaves are afterward put upon the heap, to prevent alternate freezing and thawing.

Improved Green Okra is grown in rows two feet apart, with plants a foot apart in the rows.

HERBS. Basil, Winter and Summer Savory, French and English Thyme, Sage, etc., are grown. A bed four or five feet wide is laid out in crosswise drills six inches apart. The plants are thinned out to an inch or more apart. In sowing the seeds a mark is made with a lath, and the seeds covered as lightly as possible. Sage and some of the larger seeds are sown a little deeper.

POTATOES. The Early Ohio Potato is used for first crop. It is the most prolific and profitable early variety at Harrisburg. The ground is given a heavy coat of barnyard manure in the fall and plowed. It is again plowed in the spring, and a ton per acre of Mapes' Potato Fertilizer is applied. Half the fertilizer is spread broadcast and half scattered in the row. A chain is afterward dragged along the row, to further scatter

the fertilizer before dropping the Potatoes. Ten bushels of Potatoes per acre are used for seed purposes.

Two weeks later the main crop of Potatoes is planted. The leading variety is Burbank's Seedling. Carman No. 3 is also in favor. The late Potatoes as a rule are put on cornstalk ground, and fertilized as above, but have only one plowing. The manure is put on the ground in the spring.

CABBAGE. The Cabbages used are Large Wakefield, Early Summer, Succession and some Flat Dutch. The Cabbage is either used fresh, made into kraut, or stored for winter. For storage the Cabbage is arranged in compact heaps, with heads inverted, and covered with hay. A little earth is used to keep the hay in place, but it is intended that the Cabbages shall freeze solid. They must be kept shaded, which is effected by the covering of hay ; but people usually cover too deeply with soil. (Harrisburg Note, January 16, 1897 : "One or more car loads of Cabbage heads, without stems, in heap in open ground, covered merely with hay, apparently in perfect condition.")

BEETS. Three kinds used—Egyptian, Eclipse and Edmand's.

SWEET CORN. The first variety planted is Adams' Extra Early. It is not sweet, but will stand more cold than anything else ; planted sometimes in March. The second planting is Stabler's Extra Early and then Country Gentleman ; then Stowell's Evergreen until July first. A "good planting" of Crosby's Extra Early is put in as late as July 15th or 20th—which is seldom caught by frost.

LETTUCE. Hittinger's Belmont Forcing Lettuce is used under glass. Salamander and Improved Hanson are used in the open air in early summer.

TOMATOES. Atlantic Prize and Stone are the main open-air varieties.

ONIONS. Home-raised onion sets are used ; Prizetaker and Silver Skin. Wood ashes is in favor as a top-dressing—about 50 bushels of ashes to the acre.

KALE. Imperial Long-standing is the variety used. It is sown broadcast, among the corn, after the last working. It is not covered or protected during the winter.

SPINACH. Sown broadcast ; sometimes covered lightly with straw in winter.

RADISH. White Box is the main reliance, though a pound or so of Early Scarlet is sown in spring, as it matures ahead of White Box. Round Scarlet China and California White Winter are used for fall planting. They are buried in the soil, and kept for winter use. They require more covering than turnips.

TURNIP. Purple-top White Globe is the main reliance. Scarlet Kashmyr is also used. Early Purple-top Milan and Early Munich are sown in spring.

SQUASH. Crookneck and Boston Marrow are mostly planted.

CELERY. Golden Self-Blanching and Giant Pascal are mainly grown. The annual planting is 25,000, and it requires 2500 stalks for a single "mess."

CAULIFLOWER. Dwarf Erfurt is one of the varieties grown.

ASPARAGUS. Rows six feet apart, with plants 15 to 18 inches apart in the rows ; two-year old roots preferred. The plan is to dig trenches, use manure, and set plants with crowns eight inches below the natural level of the ground. As the manure decays the crowns sink a little deeper.

GLOBE ARTICHOKE. Grown in rows three feet apart, with plants two feet apart in the rows. It must be protected in the winter.

CARDOON. Grown in rows three feet apart, with plants a foot apart in rows. Hilled up like Celery, and bleached with soil after tying tops together. It is a rank grower, and coarse and hard to handle. It grows to a height of four feet. Mr. Paget says it "looks like a big thistle, and feels like one, too."

The constant and intense cropping of the Asylum garden caused it some years ago to become (in Mr. Paget's language) "vegetable sick." It was accordingly moved to new quarters, and the old garden allowed to rest. About eighteen acres are devoted to high culture, with from two to four crops per year.

CHAPTER XXX.

OUR WINTER MARKETS.

A winter market report of to-day would have been surprising news to our forefathers ; nor is such a report without interest to the present generation, for it shows that summer and winter and time and distance are fast disappearing as controlling factors governing the food supplies of the world.

The following paragraph is from *Garden and Forest*, published at New York, dated February 17, 1897. It is also applicable to the Philadelphia markets :

Dandelion is now coming from the meadows of New Jersey and from under glass, the forced plants being more luxuriant in growth, though not more tender. Both sell for fifteen cents a quart. Other offerings in collections of fresh vegetables are spring onions and leeks, chives in little clumps of soil, endive, chervil, fetticus, watercress, mint, escarole (a kind of endive), tarragon, parsley and sorrel. Well-grown shoots of rhubarb cost ten cents for a bunch of seven ; Boston cucumbers, twenty-five cents each. Okra, from Cuba, costs ten cents a dozen, and peppers five cents apiece. Short plants of celery, from Rochester, New York, sell for seventy-five cents a dozen, and the longer ones, from California, beautifully blanched, for \$1.00, while the new crop from Florida commands \$1.50. The best cauliflower now comes from Florida, large perfectly white heads costing thirty-five cents each ; those from California are yellowish after the long journey, and find slight demand. Large quantities of spinach and kale have been coming from Norfolk, Virginia, one steamer last Saturday bringing 1,400 barrels of spinach and 600 of kale, and the receipts of these two vegetables for the week amounted to 11,050 barrels. These sell at twenty cents a half-peck. Florida tomatoes cost twenty cents a pound, and those from northern hot-houses forty cents. String beans are quite plentiful at twenty cents a quart, while southern peas are scarce, and some from California have sold at \$1.50 a half-peck. Bright, fresh egg plants cost twenty cents each, and new beets and kohlrabi, four in a bunch, ten cents ; and among winter roots, oyster plant and knob-celery may be had for the same price. Winter beets, carrots, turnips and parsnips are in regular supply. Cabbage, from Long Island, costs ten cents a head, and the red sort brings fifteen cents. There is also Danish cabbage in market, and new cabbage from Florida. Lettuce is coming from Boston hot-houses and from Florida and Cuba, and Romaine lettuce from Bermuda. Onions, from Bermuda and Havana, bring thirteen cents a quart. Bermuda potatoes sell for fifty cents, and sweet potatoes, from southern New Jersey, for twenty-five cents a half-peck. Mushrooms continue abundant, the best costing but fifty cents a pound. Hot-house asparagus is still a luxury, and commands ninety cents for a small bunch.

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